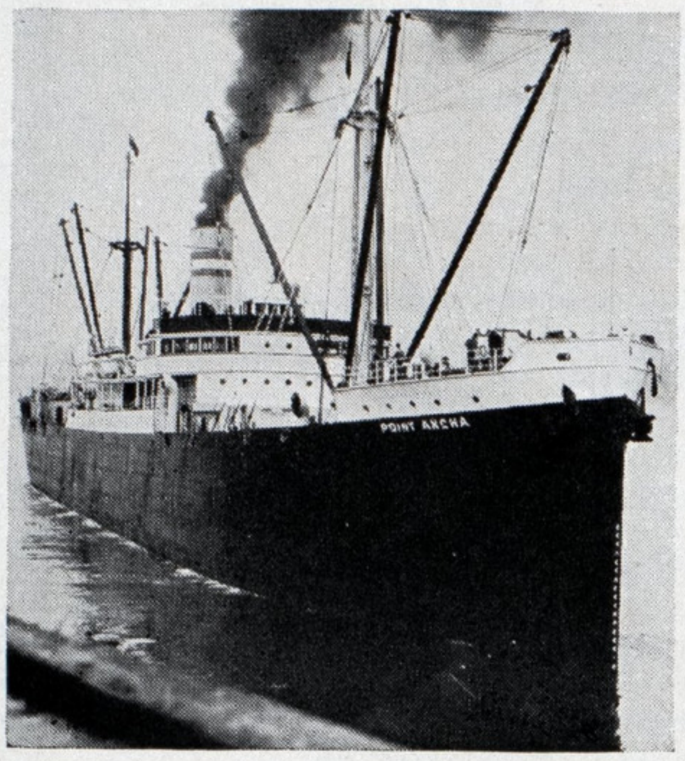
Marine Review

SHIP OPERATION SHIPBUILDING CARGO HANDLING

The National Publication Covering the Business of Transportation by Water

CLEVELAND FOUNDED 1878 NEW YORK



Cleveland Office, Penton Bldg.
A. H. JANSSON, EDITOR
F. V. COLE, BUSINESS MANAGER

New York Office, 220 Broadway
H. A. HILL
B. K. PRICE

Chicago Office, 1118 Peoples Gas Bldg.
L. C. PELOTT
W. G. GUDE

Pittsburgh Office, 1650 Koppers Building
S. H. JASPER
E. A. FRANCE JR.

Washington, D. C. Office, 1050 National Press Building
L. M. LAMM

London Office, Caxton House Westminster, S. W. 1
VINCENT DELPORT

Published monthly by The Penton Publishing Co. Cleveland, Ohio, U. S. A.

CONTENTS

Vol. 65 **October, 1935** *No. 10*

MARINE REVIEW is published monthly on the first of each month by the Penton Publishing Co., Penton Building, Cleveland, O.; JOHN A. PENTON, Chairman of the Board; C. J. STARK, President and Treasurer; J. D. PEASE, Executive Vice President; F. V. COLE, Vice President and Secretary; G. O. HAYS, Vice President; E. L. SHANER, Vice President.

Member, Audit Bureau of Circulations, Associated Business Papers Inc., and National Publishers Association.

Subscription in the United States and its possessions and in Cuba and Mexico, $3 per year; single copies 35 cents, back numbers over three months 50 cents. Subscription in Canada $4 per year; in Great Britain and other foreign countries £1 per year. Cable addresses: Penton, Cleveland, and Irotrapen, London.

Entered in the post office at Cleveland, O., as second class matter under the act of March 3, 1879.

Marine Review

FOUNDED 1878

SHIP OPERATION - SHIPBUILDING - CARGO HANDLING

Volume 65 October, 1935 Number 10

To Build New Cabin Liner For Atlantic Service

THAT decisive action by Secretary Roper, with reference to the government's contract with the United States Lines Co., now makes certain the building of a third liner similar to the MANHATTAN and WASHINGTON, but somewhat larger, faster and of generally improved type, comes as good news. Under the original contract, the time for compliance with its terms was up on Sept. 18. In extending this time 90 days, the secretary of commerce specifically required that a firm contract for building the ship must be let not later than Dec. 16 and that failure to do so, "will mean that immediate demand must and shall be made for the $1,000,000 liquidated damages." It is known that the company has accepted the terms of the revised contract.

The terms of the revised contract specify the following schedule which must be adhered to by the United States Lines Co.:

"That a preliminary application be made to the United States shipping board bureau by Oct. 10 and simultaneously plans and specifications be sent to the shipyards for bids.

"That shipyard bids be received and opened by Nov. 12.

"That formal application to the United States shipping board bureau be made as soon after Nov. 12 as possible.

"That a firm contract be let for the construction of the ship by Dec. 16, 1935."

The secretary particularly emphasized safety features of the new vessel. Other provisions of the order are:

"In the contract with the United States Lines Co. of March 18, 1935, by which that company was permitted to withdraw the LEVIATHAN from operation, the obligation was assumed by the company to construct a new vessel of the MANHATTAN-WASHINGTON type at the earliest possible date.

"It was specifically provided in that contract 'that a firm contract for construction of said new vessel will be made within six months from the date of this agreement, unless the time is extended by the secretary.'

"The contract further provided that if the company defaults in the performance of any of its obligations thereunder it will pay to the United States $1,000,000 as liquidated damages.

"The contract also provided the alternative of a construction subsidy or a construction loan. Specifically it provided that if legislation for absorption by the government of all or any part of the differential in the cost of constructing the vessel in the United States and in a foreign country should be enacted by this session of congress which has just adjourned, such legislation should apply to the construction of such new vessel, but if such legislation was not enacted by that session of congress, then the government agreed to make a construction loan under existing law provided the company complied with the requirements for such a loan.

"Based on facts established at the Sept. 4, 1935 conference, held in the board room of the United States shipping board bureau, no vessel will be built which does not conform in every way to the latest safety developments in the art of ship construction.

"With recent marine disasters as a guide, there shall be incorporated in the plans for the new ship contemplated. Provision for three compartmentation throughout and for stability in damaged condition at both light and loaded draft with minimum ballast; adherence to recently developed principles for fire resisting construction, and minimization of vibration.

"Therefore it is ordered that plans providing further safety factors, some of which are herein mentioned, be submitted to the United States shipping board bureau on which construction bids be requested."

In spite of temporary setbacks, the American merchant marine is here to stay and will be developed into an efficient instrument to serve the national welfare. With good will and cooperation between the government and all maritime interests effective subsidy legislation can and must be approved in the next session of congress.

PORTLAND, OREGON

Has Ample Facilities for Ocean Trade

BY PHIL THURMOND

FOR several years Portland, Oreg., has been developing a large general export and import business, with new classes of commodities taking an important place in the port's total tonnage. Notwithstanding this trend, a few main products still constitute a large bulk of the commerce. Lumber, wheat, flour, paper and fresh fruit remain as the chief reason why 1700 to 2000 ships call at Portland annually. The first two commodities named often constitute four-fifths of the port's foreign exports, with flour and fresh apples next in line. Naturally, therefore, Portland's docks and loading facilities have been built for the most part to accommodate these items of commerce.

Business of Port Improving

Business at the port of Portland is improving. Notwithstanding the depressing effect of two major strikes, that of the longshoremen last year and the lumber strike this year, general business of the port has shown a healthy gain. It is generally conceded that if American wheat were not completely shut out of the world market because of high prices, Portland's ocean commerce would have registered tremendous increases in the last two years. With this greatest of all exports of the port completely stopped, the totals are not startling. It is only when one begins to examine the individual commodity gains that real progress is apparent.

With the slump in wheat shipments and the strike in the lumber industry, flour now takes its place as the "number one" export from Portland. In the first six months of 1935 approximately $6,500,000 worth of flour was shipped from Portland to other United States ports. The quantity was 1,175,000 barrels. Added to this were 88,300 barrels exported to foreign countries.

Probably no other commodity, with the possible exception of fresh apples, is so widely distributed from the port of Portland as paper. About 45,000,000 pounds of paper, mostly newsprint and wrapping, left Portland in the first six months of this year to be used on presses and for other purposes in almost every country on earth. About 34,000,000 pounds of apples were almost as widely distributed.

Scrap iron and steel shipments to the Orient have helped to offset the loss of wheat cargoes. Almost 100,000,000 pounds were exported during the first half of this year.

Lumber is loaded mostly from private mill docks. Many of these mills are equipped for rapid dispatch when loading a ship. The most interesting piece of machinery in this loading process is the gasoline or electrically-powered lumber carrier. These machines will straddle a sling load of lumber, lift it and move at a high rate of speed over the mill yard and dock to ship's side.

Traveling Crances are Used

For the heavier timbers such as squares, logs and poles each mill generally has a traveling crane running on rails from the yard to the edge of the dock. Ship's tackle is not used in loading these timbers. A practice rather common at this port is to load one side from barges at the same time the ship is loading on the other side from the dock. This operation takes place at railroad sidings and general cargo docks and frequently at mill docks.

The city of Portland recognized the need of proper docking facilities soon after the close of the war by completing construction of four municipal docks, of which three are now operating. A description of one of these terminals will give an idea

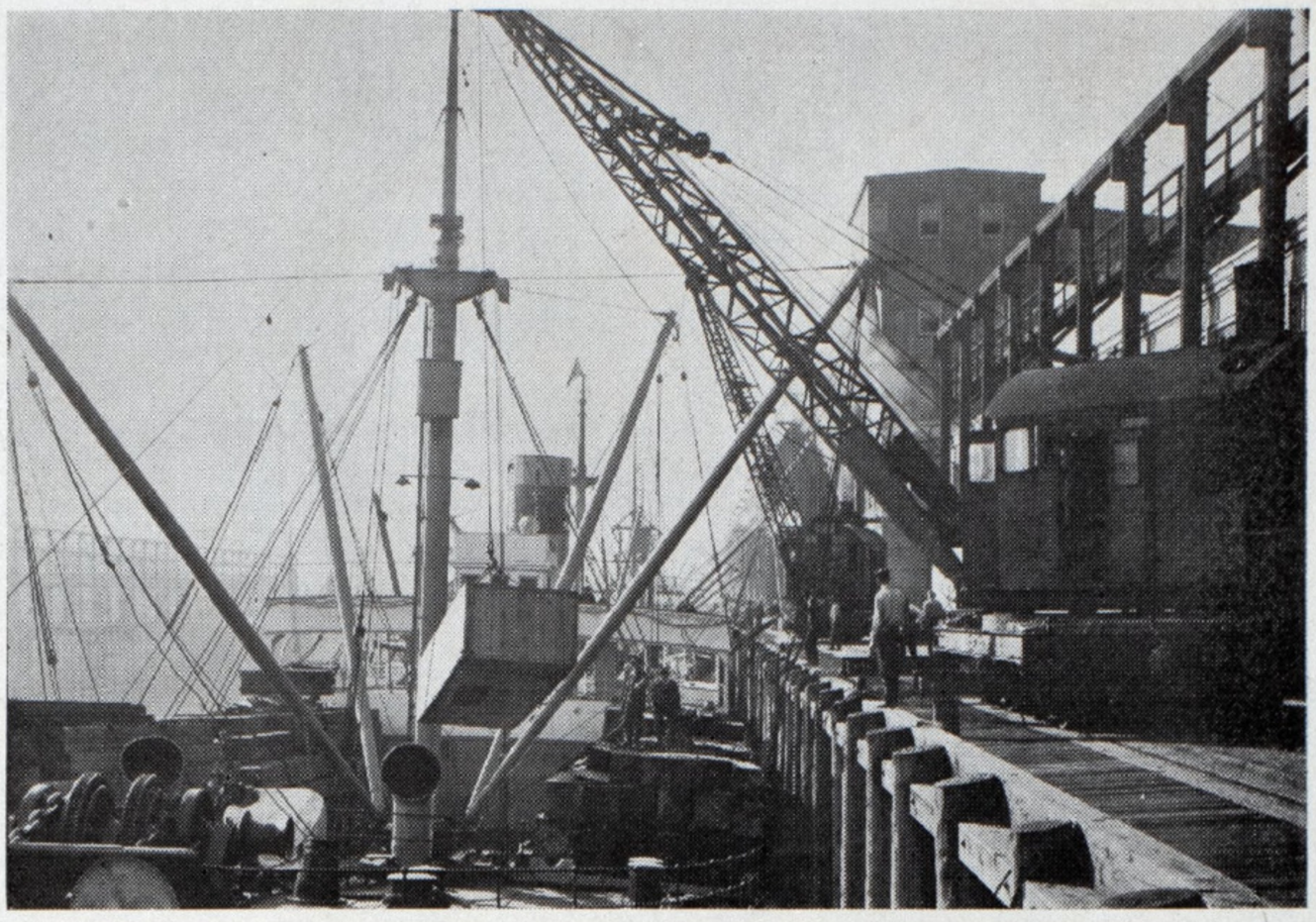
---

The author, Phil Thurmond, is manager of the Foreign Trade Department, Portland Chamber of Commerce, Portland, Oreg.

Part of upper harbor. Several large terminals are located here. Tendency now is to build new docks in lower harbor

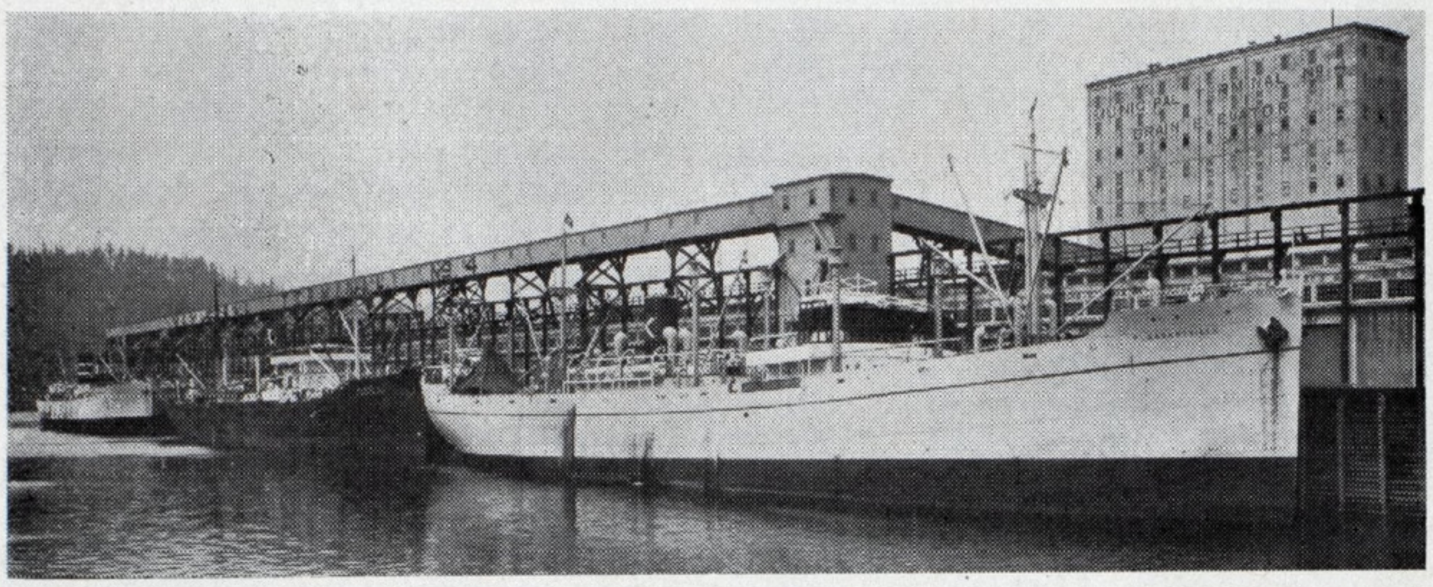
of the facilities provided at Portland for the quick turn-around of vessels.

Municipal Terminal No. 4 is located on the east bank of the Willamette river in the extreme lower harbor. It is used extensively in the handling of transpacific-transcontinental traffic, full cargo charters and the handling of all bulk commodities. The working capacity of trackage at the dock is 425 cars although 800 cars are accommodated at one time. The shipside trackage accommodates



At right—Locomotive cranes loading automobiles for foreign shipment (Orient). Note method of lashing timbers (Jap squares) on deck

Below—Vessel taking on wheat and general cargo at Pier 1, Municipal Terminal No. 4, Portland, Oreg.



130 cars. There are two locomotive cranes of 25 tons and 15 tons capacity, respectively, one gasoline crane, switch engine, gasoline tractors or "jitneys," elevators, cargo and other mechanical equipment.

Extensive Municipal Terminal

At this one terminal there is more than a mile of berthing space and close to a million square feet of covered warehouse space. The bulk grain elevator of reinforced concrete construction has a capacity of approximately 2,000,000 bushels with a ship loading capacity of 30,000 bushels of wheat per hour under normal working conditions. Elevator equipment includes five smutters, three separators, one Carter disc separator, two double and two single cylinder washers, three moveable strippers over tanks bulk power shovels, electric car pullers and dust collecting system. All machinery is electrically driven.

The grain section of the pier is equipped with sacking-out facilities, belt conveyors connecting with the elevator and appliances for unloading, handling and cutting in sacked wheat. A two-belt shipping gallery connecting with the elevator extends the full length of the grain pier and is equipped with eight moveable trippers and fourteen loading spouts.

A modern brine system cold storage plant adjoins one of the piers at this terminal. Capacity of the cold rooms is 110,000 boxes of apples. Construction is of hollow tile with standard cork insulation. Features of the equipment are electric fan air ventilation system, duplicate pumping machinery and gravity conveyors.

In connection with the cold storage plant on one side and Pier No. 1 on the other side, is a ventilated fruit warehouse of 250,000 boxes capacity. Construction is of hollow tile, ventilation system is electrically operated and doors and windows are insulated against extreme temperatures. Gravity conveyors are used in transferring fruit into this warehouse from the cold rooms and out again to the pier, supplemented usually by "jitney" drawn trucks which place the boxes at ship's tackle.

Oil and Molasses Plant

Adjacent to the main piers is a bulk oil and molasses storage plant, with a capacity of 1,486,800 gallons. This plant consisting of 14 steel tanks is utilized for bulk vegetable oils and molasses from the Orient and Hawaii. Equipment comprises a heating plant, two 60-ton steel tank scales, electric pumps—including a two-stage turbine sinking type ship pump with capacity of 165 tons of bulk oil per hour, compressed air and steam plant, and facilities for barreling or bulking oil, loading cars and cleaning tank cars. Double mains connect the plant with the two main piers of the terminal.

Bunkers with concrete bins of 10,000 tons storage capacity are located on Pier No. 5 for handling bulk coal, concentrates, ore, phosphate rock and other commodities in bulk. Electrically driven unloading and handling facilities, conveyor belts, traveling ships' towers and car tippers are operated in conjunction with the bunkers.

An administration building in which are housed the administrative, operative and clerical staffs of the terminal and the offices and laboratories of the state and federal grain bureaus and the marine radio sta-

---

A SPECIAL committee is studying the advisability of applying for permission to establish a free trade zone at Portland. Should this go through, the great fleet of fresh fruit carriers that come to Portland from Europe for the valuable refrigerated eastbound cargo could, instead of coming in ballast, bring cargo destined for the Orient which could be unloaded in the foreign trade zone without passing through customs and then trans-shipped under favorable conditions.

Author's Note

---

tion is a two-story structure. In conjunction is a cafeteria with a seating capacity of about 200 persons. A welfare building houses the United States public service quarantine station and is fitted with rest rooms, shower baths, etc.

Another feature is the standard track scale installed by the commission of public docks in the switching yards of Terminal No. 4 for weighing cars. In shipping carload lots of bulk or heavy commodities the cars may be weighed heavy or light, weight certificates obtained immediately, over or under loads corrected, advances figured, etc., before cars leave the yard. Operation of this scale is under the supervision of the transcontinental freight bureau.

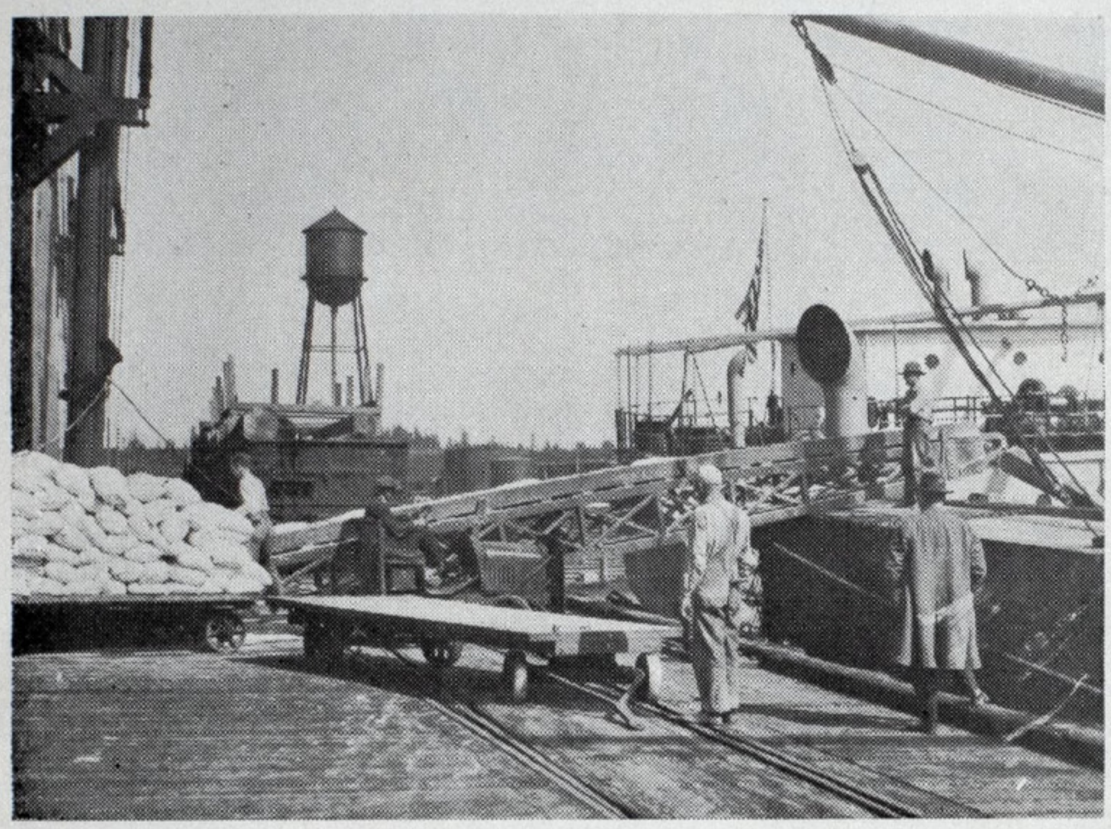
A complete fumigation plant equipped with modern machinery for the successful fumigation of all import commodities is located in close proximity to the main piers. This plant is operated by a private company under the supervision of the state and federal agencies.

Rail Lines Co-operate

The transcontinental rail lines, under joint arrangements, have an agency at Terminal No. 4 with an accredited agent and staff occupying offices on the main pier. All business in connection with rail traffic to and from the terminal is handled through this office. An efficient yard switching service is performed under the direct supervision of this agent.

Federal and state bureaus represented at the terminal are the grain inspection department of the state of Oregon with offices and laboratory, the federal grain inspection division of the department of agriculture with office and laboratory staffs, the United States public health service quarantine station and the United States customs service. The quarantine anchorage grounds for the port are but a quarter of a mile from the terminal. Since the establishment of the quarantine station in 1928, foreign vessels have been enabled to enter the Columbia river and steam direct to Portland without the delay of clearing quarantine at the entrance.

The site on which the terminal is located comprises 211 acres, entirely wire fenced, and the commission of public docks has made a great part of this tract available for long term leases at low prices. The first private enterprise to take advantage of the opportunity to lease was a milling company which erected a complete flour milling plant on a site adjacent to the grain elevator. Belt conveyors



Loading flour by power conveyor and gravity chute into ship's hold at Portland, Oreg.

Spouting wheat from loading gallery into ship's hold at Portland, Oreg.

for the receipt of grain connect the mill with the elevator, and conveyors deliver the finished exportable products direct from the mill to the pier. The original mill has been improved and enlarged and the present capacity of the plant is 1500 barrels per day.

It has been stated by shipping authorities that the port of Portland through its facilities for handling cargo could handle three times the amount of cargo that now passes over its docks. This far-sighted policy of building for future business has been consistently followed by the community and its port bodies which include the commission of public docks, the port of Portland commission, the port traffic bureau and foreign trade department of the Portland chamber of commerce.

The port traffic bureau is financed by the port of Portland commission and the chamber of commerce. Its function is to advise shippers on rates, handling charges, routing, etc., on goods shipped through Portland. The manager of this bureau travels extensively in Oregon, Washington and Idaho and in the few years he has been operating the bureau it has returned thousands of dollars of new and recaptured business for each dollar spent.

Deep and Wide Channel

The history of Portland's efforts to provide an easy channel from its harbor to the sea dates back to the year 1878 when the first government project for improvement of the Columbia river was adopted. The pr sent ship channel has a depth of not less than 35 feet and is 500 to 1000 feet wide. The entrance of the Columbia river measures from 44 to 62 feet in depth on the main channel and a minimum depth of 40 feet between the ends of the jetties. Obviously, these depths are more than ample for any ordinary commercial or naval ship wishing to traverse the entrance of the great stream.

Every possible aid to safe navigation is provided for vessels calling at Portland. Radio direction finders are operated by the navy department at locations both north and south of the river entrance. The lightship anchored off the entrance is equipped with every modern aid, including a radio beacon. The inside channel is well marked with lights and buoys, and the efficiency of Columbia river pilots is a by-word among ship masters. Ships are not delayed because of foggy weather or night navigation.

Nearly a billion and a half feet of lumber have been floated out of the Columbia river in a single year and Portland has long been recognized

(*Continued on Page* 14)

Award Contracts for Naval Ships

Private Shipyards to Build Twelve

ANOTHER extensive addition to the building program of the navy is now underway. On Sept. 9 the navy department awarded contracts, as a result of bids received Aug. 7 from six private shipbuilding companies, for the construction of 12 war vessels of various types. On the same day, the department allocated the building of 11 war vessels of various types to seven navy yards. This makes a total of 23 vessels so far placed in the fiscal year 1936, for which funds were provided in the naval appropriation act signed June 25.

Six Shipyards Tender Bids

Bids were received from six private shipyards on 13 vessels but only 12 have been awarded. All bids for light cruiser No. 49 were considered unsatisfactory and were rejected. Bids on this vessel, however, are being readvertised, and the date for opening of bids is set for Oct. 2.

For convenience, the results of the awards of contracts to private shipyards and the allocation to navy yards are arranged in tabular form below. It is to be noted that the prices listed in the case of the private shipyards are in all instances subject to adjustments for changes in the cost of direct labor and material.

The placing of these vessels, it is understood, brings the navy up to treaty limits in all classes except destroyers and submarines. Next year's naval building program, for the fiscal year 1937, will include twelve 1500-ton destroyers, six submarines and perhaps a battleship. The program for each of the fiscal years 1938 and 1939 also include 12 destroyers and six submarines.

Except for battleship replacement, and according to the naval agreements, no capital ships can be laid down before Jan. 1, 1937, the completion of the entire program noted above in 1942 will bring the United States fleet up to treaty strength.

The award of contracts in the current program was made to the lowest satisfactory bidder in each case, and all bids, except those for the light cruiser, were considered satisfactory. Hitherto the new aircraft carriers ordered have been placed with the Newport News Shipbuilding & Dry Dock Co., no other shipyard having built any ships of this type from the keel up. However, the Bethlehem Shipbuilding Corp., low bidder for the aircraft carrier in the current program and recipient of the award, did complete the LEXINGTON as an aircraft carrier, though this vessel was originally laid down as a battle cruiser. The Newport News Shipbuilding Co. built the RANGER and now has under construction the YORKTOWN and ENTERPRISE.

Bids for Light Cruiser

The rejected bids on the light cruiser were as follows: Newport News Shipbuilding & Dry Dock Co., $15,525,000, delivery in 34 months and $13,500,000 on the basis of existing prices. Bethlehem Shipbuilding Corp., $17,600,000, delivery, 36 months, and $14,100,000 at existing prices. Federal Shipbuilding & Dry Dock Co., $17,000,000, delivery, 36 months, and at existing prices, $15,200,000. United Shipbuilding & Dry Dock Co., $17,920,000, delivery, 36 months, and at existing prices, $15,590,000. Contracts for the two light cruisers awarded last year, one each, to the Newport News Shipbuilding & Dry Dock Co. and the New York Shipbuilding Corp., were placed at a cost of $11,650,000 and $11,975,000 respectively.

Construction Awards for 23 Naval Vessels—Sept. 9, 1935

To Private Shipyards

Private Shipyards	Number	Type	Delivery (Months)	Total Amount
Bethlehem Shipbuilding Corp., Quincy, Mass.	1	Aircraft Carrier	36	$20,737,000
Bath Iron Works Corp., Bath, Me.	3	Destroyers (1850-ton)	27, 30 & 33	11,647,500
Bethlehem Shipbuilding Corp., Union Plant	2	Destroyers (1500-ton)	27 & 30	7,350,000
Federal Shipbuilding & Dry Dk. Co., Kearny, N. J.	3	Destroyers (1500-ton)	26, 29 & 32	*12,000,000
Electric Boat Co., Groton, Conn.	3	Submarines	27, 30 & 33	7,491,000
Totals	12			$59,225,500

To Navy Yards

United States Navy Yards	Number	Type	**Delivery (Months)	**Total Amount
Portsmouth, N. H.	2	Submarines	27 & 30	$5,000,000
Mare Island, Calif.	1	Submarine	27	2,500,000
Boston	2	Destroyers (1500-ton)	27 & 30	7,600,000
Philadelphia	1	Destroyer (1500-ton)	27	3,800,000
Norfolk, Va.	2	Destroyers (1500-ton)	27 & 30	7,600,000
Charleston, S. C.	1	Destroyer (1500-ton)	27	3,800,000
Puget Sound, Wash.	1	Destroyer (1500-ton)	27	3,800,000
New York	1	Light Cruiser (10,000-ton)	36	13,200,000
Totals	11			$ 47,300,000
Grand Totals	**23**			**$106,525,500**

*Note:—The evaluated bid on these destroyers was $3,753,500 each, a total of $11,260,500.
**Note:—For the Navy Yards, no time of delivery nor estimate of cost of construction of the vessels listed have been announced. Both the time and the cost noted are simply estimates based on the bids from private shipyards for the same class of vessel and the cost given is in round numbers.

Portland, Oregon

(*Continued from Page* 12)

as the first lumber port in the United States. Also in normal cereal years, Portland ships more wheat than any other port in the nation. Negotiations by which the federal farm board shipped millions of bushels of wheat to China in the depression years enhanced Portland's standing as the chief wheat export port of the United States. Over half of this movement was loaded at Portland alone. Recent developments give promise that Portland may soon lead the nation in fresh fruit shipments.

Passenger Traffic Growing

A new development at Portland is the steady growth of passenger traffic. Heretofore, travel by water to and from Portland has been confined almost exclusively to California ports. In the last few years, foreign passenger service has picked up until accommodations have been inadequate. Each sailing of the ships in Portland's home-owned "General Line" shows an increased passenger list over the preceding departure. This service operates American flag ships to Japanese ports, Shanghai, Hongkong and Manila.

The Columbia basin, contributary by water grade thrcugh the Cascade range to Portland, consists of 200,000 square miles, mostly in Washington and Oregon. The Willamette valley, draining into Portland, has an area of 11,000 square miles, and is very fertile.

Portland is served by four transcontinental railroads, about 125 auto-truck lines, six river boat lines and the finest air service in the nation. Fifty ocean shipping lines connect Portland with the world. The fresh water harbor, with almost no tidal fluctuation, varies from 900 to 1600 feet in width and has 27 miles of deep water frontage. Two dry docks, owned by the port of Portland commission, will accommodate vessels up to 550 feet in length.

The Bonneville dam now under construction by the federal government is expected to add greatly to the prestige of the port. This dam is on the Columbia river, forty miles east of Portland.

Atlantic Passenger Traffic Shows Big Increase

A RECENT survey, completed by the United States shipping board bureau, shows that American shipping companies are facing a difficult problem in handling the returning westbound traffic from European ports, as the present season draws to a close. The report reveals that over 130,000 passengers were transported to European ports during the months of May, June and July of this year, and only 56,000 of these tourists have returned to the United States, leaving approximately 74,000 passengers who will require westbound sailing accomodations during remainder of the season.

Twelve nations, with 107 vessels of 1,704,000 gross tons, offering almost daily service to European ports, have had a share in the transportation of passengers eastbound. On June 29, over 14,000 set sail from New York, as compared with 9075 for the corresponding day last year.

Having Full Bookings

Not since 1929 has the American shipping industry enjoyed such a large business in transporting eastbound transatlantic passengers. The present facilities of the American steamship companies have frequently been taxed to capacity and some lines report that hundreds of passengers have been turned away because of insufficient tonnage.

American cabin liners and combination vessels are gaining in popularity over the superliners of foreign registry, and they operate at greater efficiency with respect to comparative tonnage and available passenger space. American vessels not only carry proportionately more passengers for their available accommodations than do any of their principal foreign competitors, but they also are carrying more for each 1000 net registered tons of the vessel. The British flag lines, for example, controlling about 37 per cent of the passenger accomodations, carry only 27 per cent of the passengers, whereas American lines, controlling only 8 per cent of the space, transport over 11 per cent of the traffic.

With each new season, it beaomes more apparent that the American traveling public appreciates the more familiar atmosphere of its own vessels. This growing demand for accommodations on American lines refutes the idea sometimes advanced that Americans are unpatriotic in choosing their means of transportation when going abroad.

When comparing individual ships such as the MANHATTAN and WASHINGTON of the United States lines with the BREMEN and EUROPA of the North German Lloyd; the NORMANDIE and ILE DE FRANCE of the French line; and the BERENGARIA and MAJESTIC of the Cunard-White Star line, some striking results may be noted. For the three-month period of May, June and July, the percentage of available space filled on the MANHATTAN and WASHINGTON, eastbound and westbound, was 72 per cent for each ship; for the BREMEN and EUROPA, 57 per cent and 58 per cent, respectively; for the NORMANDIE and ILE DE FRANCE, 59 per cent and 45 per cent; and for the BERENGARIA and MAJESTIC, 36 per cent and 28 per cent.

Cabin Liners Popular

Comparisons on a tonnage basis show that the MANHATTAN carried 63 passengers per 1000 net registered tons, the WASHINGTON 58, the EUROPA 55, the BREMEN 51, the NORMANDIE 31, the ILE DE *FRANCE* 33, the BERENGARIA 35, and the MAJESTIC 30.

In still another comparison, that of the ratio of gross tonnage to passenger accommodations, the American type of vessel shows to advantage. Contrasted with the NORMANDIE and her 78,800 gross registered tons, the MANHATTAN and WASHINGTON, with 24,289 tons, are each less than one-third her size; yet the MANHATTAN has accommodations for 1230 passengers, the WASHINGTON for 1087, and the NORMANDIE for only 1968. The ILE DE FRANCE, of 43,450 gross tons, makes but little better showing, having accommodations for 1574; while the BERENGARIA, of 52,101 gross tons, has 1960; and the BREMEN, of 51,656 gross tons, and EUROPA, of 49,746 gross tons, have accommodations for 1934 and 1903 respectively.

The Baltimore Mail line, American Scantic Line, American Merchant line, and American Export line, operating combination liners of relatively limited passenger capacity, are doing better than the larger cabin liners, according to the report. The CITY OF NEWPORT NEWS of the Baltimore Mail line registered 95 per cent capacity on two out bound sailings; the CITY OF HAVRE, 94 per cent on two sailings; the CITY OF HAMBURG, 92 per cent on three sailings; and the CITY OF NORFOLK, 90 per cent on three outbound sailings. Seven of the American Scantic line's fleet of nine vessels sailed outbound with 75 per cent to 93 per cent of their capacity filled. The entire fleet of the American Merchant line averaged 80 per cent capacity on all outbound sailings, and American Export line 83 per cent.

Analysis of the report of the shipping board bureau shows that nothing is wrong with American ships or with American support of its merchant marine. The only answer to this increased demand is new tonnage—tonnage to meet the popular call for reasonable comfort and reasonable speed at reasonable fares.

BUNKER FUEL OIL,

Commercial and Naval Requirements*

FUEL oil can be defined in many ways. To the user it is a source of energy. The name is derived from this last definition. Any user of marine fuel oil, either bunker or diesel, must purchase his fuel to some specification. Likewise every barrel of fuel oil which a refiner sells must meet some specification.

Fuel oil of any kind, for any use, must be handled and it must be burned. At any moment a user must have oil of a grade which his equipment can properly handle and burn. If economic conditions warrant, he can modify or replace his equipment at any time to take advantage of a cheaper grade of oil but he cannot use the cheaper until all equipment served from a common fuel oil supply has been altered.

Since any boiler or diesel engine installation is a fixed thing, it is surely to the interests of a user to have a fairly close and definite purchase specification. He can properly use two; one for current use in his existing installations, and one for design purposes which represents the best opinion as to the kinds of fuel oil which will be the cheapest marketed during the life of his new equipment for design purposes.

The refiner's objection to a close specification for fuel oil is that his products vary over wide limits in characteristics, some of which neither he nor anyone else fully understands. He can accept a standard of classification which is about the best which has been generally imposed to date.

Bunker Fuel Oil Specifications

It has already been stated that existing published specifications actually amount to very little more than standard classifications. The specifications referred to are the federal specifications and the commercial standard recently revised and reissued by the department of commerce.

The former carries four grades or classes of fuel oil all in the bunker class; the latter contains six classes but only two of them can be considered as bunker fuel oils.

The following tables give the specified characteristics of the above-mentioned specifications.

Naval experience, during and shortly after the war, clearly indicated that any probable sulphur content of fuel oil was not sufficiently undesirable to require the specification of any sulphur limit. As a result, the navy shifted to bunker A fuel oil and navy standard fuel oil ceased to be a bunker fuel oil but became an industrial fuel oil for metallurgical, ceramic and similar purposes.

Federal Specifications

Grade	Maximum Viscosity	Flash Point deg. F., min.	Water and sediment, max. per cent	Sulphur, max. per cent
Navy standard	100 SSF at 77° F.	150	1	1.5
Bunker A	100 SSF at 77° F.	150	1	no limit
Bunker B	100 SSF at 122° F.	150	1	no limit
Bunker C	300 SSF at 122° F.	150	2	no limit

Commercial Standards

Grade	Maximum Viscosity	Flash point deg. F.	Water and sediment, max. per cent	Sulphur
5	100 SSF at 122° F.	150	1.0	no limit
6	300 SSF at 122° F.	150	2.0	no limit

FUEL is one of the principal items of expense in vessel operation. Fuel oil, a by-product in refining crude oil, varies widely in those properties which make it a desirable fuel for shipboard use. To the navy it is of the utmost importance that there should be available at widely distributed points, an ample supply of a good quality of fuel oil that can be handled and burned with complete dependability. To the merchant marine cost is also a matter of great importance. What can be done, within these limitations, to improve the quality of fuel oil and to increase its effectiveness in furnishing power for marine use is discussed in this article.

Editor's Note.

Of the three bunker fuel oils, which can now be considered as standards, the following limits of use can be stated:

Bunker A fuel oil can be used and pumped at full capacity by any vessel operating in water of any temperature without any preheating in the bunker storage tanks.

Bunker B fuel oil can be used and pumped at full capacity without tank heating by any vessel operating in tropical or semi-tropical waters; and with a limited amount of tank heating, such as might be provided by a helical steam coil around the suction pipe in the tank, in any waters.

Bunker C fuel oil can be used and pumped at full capacity with limited tank heating by any vessel operating in tropical or semi-tropical waters but can be used at full power in cold water only by raising the tank temperature to 110 to 120 degrees Fahr. which may be considered the maximum safe operating temperature.

In all of the above cases it is assumed that the stowage of the oil is such that its temperature is not lower than that of the water in which the vessel is operating.

The existence of the two specifications does not mean that they govern the marketing of bunker fuel oil. They have, necessarily, as far as the navy is concerned, but to the commercial user the supplier's specifications are always available and are probably usually accepted. For the majority of refiners, the limits of the federal specification bunker C (commercial standard grade 6) probably apply, however.

Present Marine Designs

To simplify the discussion of marine designs of fuel oil installations, it is desirable to separate the system into its component parts. They are: (1) Storage and handling system, and (2) burning system. Each imposes certain restrictions on the characteristics of fuel oil which can be considered acceptable. Because of

*This article is an abstract, from the introductory part, of the paper on *Bunker Fuel Oil Problems*, by Capt. C. A. Jones, U. S. N. and Lieut. J. E. Hamilton, U. S. N., presented at the annual meeting of the Society of Naval Architects & Marine Engineers, held at New York, Nov. 15-16, 1934. The complete paper presents much detailed information of scientific and technical interest in connection with the properties of fuel oil and its use for ships of the navy as developed by the naval fuel oil investigation.

many restrictions imposed only on naval design, it is desirable to discuss separately naval and commercial fuel oil systems. (Only the latter are considered in detail in this abstract. Editor's note).

Storage and handling systems—commercial vessels: There is such a large number of commercial oil burning vessels of varying designs that a conventional and typical design will be described. The system employs large deep tanks adjacent to the boiler rooms for a service supply of fuel oil and in many cases for the larger portion of fuel oil carried. When the steaming radius requires larger bunker capacity than the service tanks provides, the peak tank, also of large size, is used; and if this is still insufficient, some of the double bottom compartments are fitted as bunkers. In any case the number of separate bunker spaces is very small and most of the tanks are quite large with comparatively small areas exposed to the temperature of the water or outside air.

These vessels are also mostly built or altered for a specific trade route where the conditions to be encountered can be closely estimated and the design made to accord.

Most of the oil burning vessels now in commission were designed, or converted from coal, after the need for heating coils in the tanks was recognized because of the increasing viscosity of the cheaper grades of bunker fuel oils. Hence, there is no doubt that the typical oil burning merchant vessel is now equipped with more or less adequate heating coils in bunker tanks to permit heating of the fuel contained for the reduction of viscosity necessary for proper pumping and handling.

The piping from the bunkers to the burning system is usually very simple and short. Since there is no very rigid restriction on space or weight, the piping installed is large enough to permit ready flow of oils with a viscosity probably in the order of 500 to 700 seconds Saybolt Furol or better.

The shipping board has, for many years, considered 375 seconds Saybolt Furol viscosity as a satisfactory one for pumping. For even longer than that the national board of fire underwriters has permitted a temperature of 120 degrees Fahr. in fuel oil bunkers and it is very probable that practically all merchant vessels are equipped to heat fuel oil to that temperature.

With these probable facts, viz:

(a) Fuel oil can be heated to 120 degrees Fahr. in the tanks.

(b) Fuel oil pumps can handle fuel oil at capacity, if the viscosity does not exceed 375 SSF.

(c) Fuel oil piping is large enough to permit practically unrestricted flow at viscosities under 500 SSF.

(d) The recognized maximum viscosity of commercially marketed fuel oil is 300 SSF at 122 degrees Fahr.

there is no reason why any merchant vessel should experience any difficulty with stowing and handling fuel oil, due to viscosity.

Burning system—commercial vessels: The burning system comprises furnaces, atomizing system, air supply and oil supply. In the usual merchant vessel the oil supply is provided by the same pump which removes the oil from the bunker tanks. The air supply is provided by forced draft blowers in the case of most of the larger vessels and by natural draft in other cases. Passages for the entering air are relatively free and unrestricted.

The atomizing system which has been generally determined to be the only practicable one for marine purposes is the pressure mechanical type. This comprises a preheater which permits delivery of the oil to the atomizer at reduced viscosity, the atomizer itself which subdivides the oil into a very fine mist and assists in mixing oil and air, and the air register which delivers air to the furnace and assist in mixing the oil and air.

Because merchant marine boilers can be designed without strict space limitations, boiler fronts are fairly large and have permitted the use in many designs of a rotary cup burner which atomizes the oil by throwing it centrifugally from a rotating cup into which the oil drools. This burner permits the elimination of preheaters.

It seems apparent that whereas there is a community of interest between merchant and naval ship designers, there is also a decided advantage in so far as the fuel oil is concerned in favor of the former. The advantage is two-fold. In the first place most merchant vessels are and can always be designed for using a cheaper and more readily available type of fuel oil than can naval vessels, and in the second place other features of the vessels permit merchant ship designers to utilize design for eliminating certain bad features of some fuel oils which must be absent from the oil bunkered by naval vessels because of the lack of design flexibility.

Fuel Oil Specifications

Considered from the viewpoint of the operating engineer-installed equipment: The operating engineer recognizes that the specification which is used for the purchase of his fuel oil provides him with oil of the following characteristics.

1. Fluidity such that his pumping equipment can handle the oil or that his heating equipment can make it fluid enough to handle.

2. Physical cleanliness such that the fouling of equipment will not be serious enough to interfere with operation.

3. Freedom from water to prevent loss of efficiency and possible interference with operation due to extinguishing fires.

4. Freedom from chemical constituents which may:

(a) Corrode equipment, (b) slag fire brick, (c) foul preheaters, and (d) cause smoke or excessive stack losses.

Considered from the viewpoint of the petroleum industry: Due entirely to the historical background of bunker fuel oil, this product is the one unmanufactured product of oil refinery. It "just happens" as a result of the manufacture of other products. In general, in any refinery running any crude oil, after all of the gasoline, kerosene, lubricating oils, and light fluid heating and diesel fuel oils are produced, there is left a gas, a liquid, and in some cases a solid hydro-carbon which cannot economically be manufactured into one of the four more valuable products. These three by-products are all fuels of widely varying qualities.

With the gaseous and solid by-product fuels we are not concerned except indirectly. Gas and coke cannot be used as fuel oil but the former is usually and the latter frequently used as fuel in the refinery. Such use reduces the amount of the liquid fuel required to operate the refinery and leaves that much more of the liquid by-product to put on the market for profit.

Economic and seasonal conditions impose a very close control on the quantities of the four more valuable products required for the market and equipment design and customer insistence through specifications impose a very close control on the quality of these products. These controls and changing characteristics of crude oil result in such varying characteristics of the liquid by-products that the refiner's interest demands that the purchase specifications under which these by-products are sold be wide enough to be unrestricted. This lack of restriction must apply to the by-product of the future because it is easy to make a specification more severe but hardly possible to make one more lenient.

Considering the requirements listed for the operating engineer, the refiner wants fuel oil specifications which require:

1. A maximum viscosity which will include the liquid by-product of today and far into the future.

2. A minimum of restrictions on physical impurities. The practical limit is freedom from these impurities which can be removed by a straining which is coarse enough to have little effect on refinery pumping costs.

3. The water limitation must be high enough to permit marketing without special treatment to remove

(*Continued on Page* 38)

Maritime Authority Control Of Ship Personnel

There is considerable sentiment at the present time toward granting to the Maritime authority, provided in the Copeland ship subsidy bill pending in the senate, the control and licensing of personnel, both from the standpoint of safety at sea and from that of securing the best type of men for the merchant marine reserve of the navy.

The Navy league in its official publication stresses this point as follows:

"It is elemental that the success of a nation's merchant fleet, either in performing its commercial or its contingent military mission, must in large measure, depend upon the quality and character of the personnel manning its ships. The best of ships, suitable in size, speed and type to its route and trade—and to its designed function in the national defense—must lose in the keen competition on the sea against equally efficient foreign ships officered by men of superior professional qualifications and higher standards of character, commanding more experienced and better disciplined crews.

"The Maritime authority under the present bill determines, allows and administers subsidies to cover the excess cost of operation over foreign ships. The operating cost, in turn, measurably depends upon the efficiency of ship personnel. The navy issues commissions in the naval reserve to merchant officers on the faith and credit of their license as such. The safety of the ship, passengers and crew depends largely upon the personnel.

"The present qualifying standards for American merchant officers are far below that of the British—our principal competitor on the sea—and while we have many merchant officers who are well qualified, some of whom have maintained the best sea traditions in meeting the emergencies of the sea, the professional standards of these efficient officers are far above the present established standards and qualifications demanded for getting an American 'ticket.'

"The contemplated plan of granting to the Maritime authority the control of material and subsidies and leaving the licensing and control of personnel in the bureau of steamboat inspection, where it has long been vested—and failed—will inevitably prove disastrous.

"Such a division of authority is neither fair to the nation nor the Maritime authority, the navy nor the ship operators.

"Responsibility for the success of this important national adventure should rest squarely upon the Maritime authority. Divided authority is the father of buck-passing, the mother of alibis and the open door to sea disasters."

Don S. Walker has been appointed district manager in the Philadelphia office of Combustion Engineering Co. Inc., according to an announcement by H. S. Colby, general sales manager of the company.

Naval Architects to Meet

The Society of Naval Architects and Marine Engineers will hold its forty-third annual meeting in the Engineering Societies building, 29 West Thirty-ninth street, New York city, on Thursday and Friday, Nov. 14 and 15, closing with a banquet on Friday, Nov. 15, at the Waldorf-Astoria hotel.

The papers to be presented are as follows: *"Engineering Education in England and Germany,"* by Lieut. R. D. Conrad; *"Determination of Anchor Holding from Model Tests,"* by Lieut. W. H. Leahy and Lieut. J. M. Farrin; *"Strength of Plating in Compression,"* by Commander H. E Rossell; *"Form Resistance Experiments";* by Capt. E. F. Eggert; *"Resistance and Wake of a Tanker Model,"* by Professor L. A. Baier; *"Methods in Producing Marine Gearing,"* by W. E. Sykes; *"Controlled Superheat,"* by T. B. Stillman; *"High Steam Pressure and Superheat Aboard Ship,"* by C. P. Wetherbee; *"Measuring Ships' Vibration in Propeller Shafting,"* by Dr. W. J. Muller; *"Propeller Vibration,"* by Professor F. M. Lewis; and *"New Studies of Ship Motion,"* by F. P. Hodgkinson and P. R. Bassett.

Membership in the society is open to all qualified applicants and the aid of members in obtaining new members or reinstating former members is requested. The executive committee has authorized the waiving of the payment of entrance fee by new members elected at the 1935 meeting.

Ship Owners' Liability is Greater Under New Law

The Copeland-Sirovich bil, prepared as a result of the investigations into MORRO CASTLE and MOHAWK disasters, passed in the last session of congress and signed by the President extends the liability of shipowners for loss of life and personal injury. This act replaces the liability limitation law of 1851 which was deliberately intended to put American shippng on an equal footing with that of other maritime nations, and as an inducement to Americans to invest their money in ships in order to build up American shippng. Under the old law, damage claims were limited to the value of the vessel unless it could be proved that the owners knowingly sent her to sea in an unseaworthy condition or were otherwise responsible for the accident.

Under the new law, the knowledge of the captain of the ship, the managing agent or of the superintendent as to the unseaworthiness of the vessel before she leaves port shall be construed to be the knowledge on the part of the owners, thus rendering them liable. The new law fixes the limit of owners' liability at $60 a gross ton of the ship in meeting claims for death or personal injury. It is believed that some new form of insurance will have to be worked out to meet the requirements of the new law.

The time within which claims for damages can be filed is also changed. Under the old law, claims had to be filed within 30 days, but under the new law the time limit is one year.

Correction Is Made

In the article on the towboat CHAMPION COAL, in the July issue of MARINE REVIEW, in referring to the three, 6 x 8 inches, double-cylinder, reversing capstans for handling lines, the name of the manufacturer was stated incorrectly. It should be the American Engineering Co.

Marine fueling station at Beaufort, N. C., on the inland waterway, operated by the Standard Oil Co. of New Jersey. The dock is conveniently located for the service of ship chandlers, marine suppliers and machine shops

MODERNIZATION

In Materials Handling in Shipbuilding

BY W. C. RAUBE*

DEFINITE and energetic action on the part of the administration in pursuance of the authorized plan to add 102 ships, over a five year period, to bring the navy up to treaty limits, represents the greatest impulse that the shipbuilding industry of the United States has received since the World war. It is significant that this shipbuilding program is a peace time project, not subject to the pressure and haste of an emergency, and therefore the application of sound economics in the production of these new ships is not only possible but essential to obtain maximum results.

By thorough modernization of facilities and careful planning and supervision the competitive position of a shipyard will be improved because of lower cost of production due to increased output and quality.

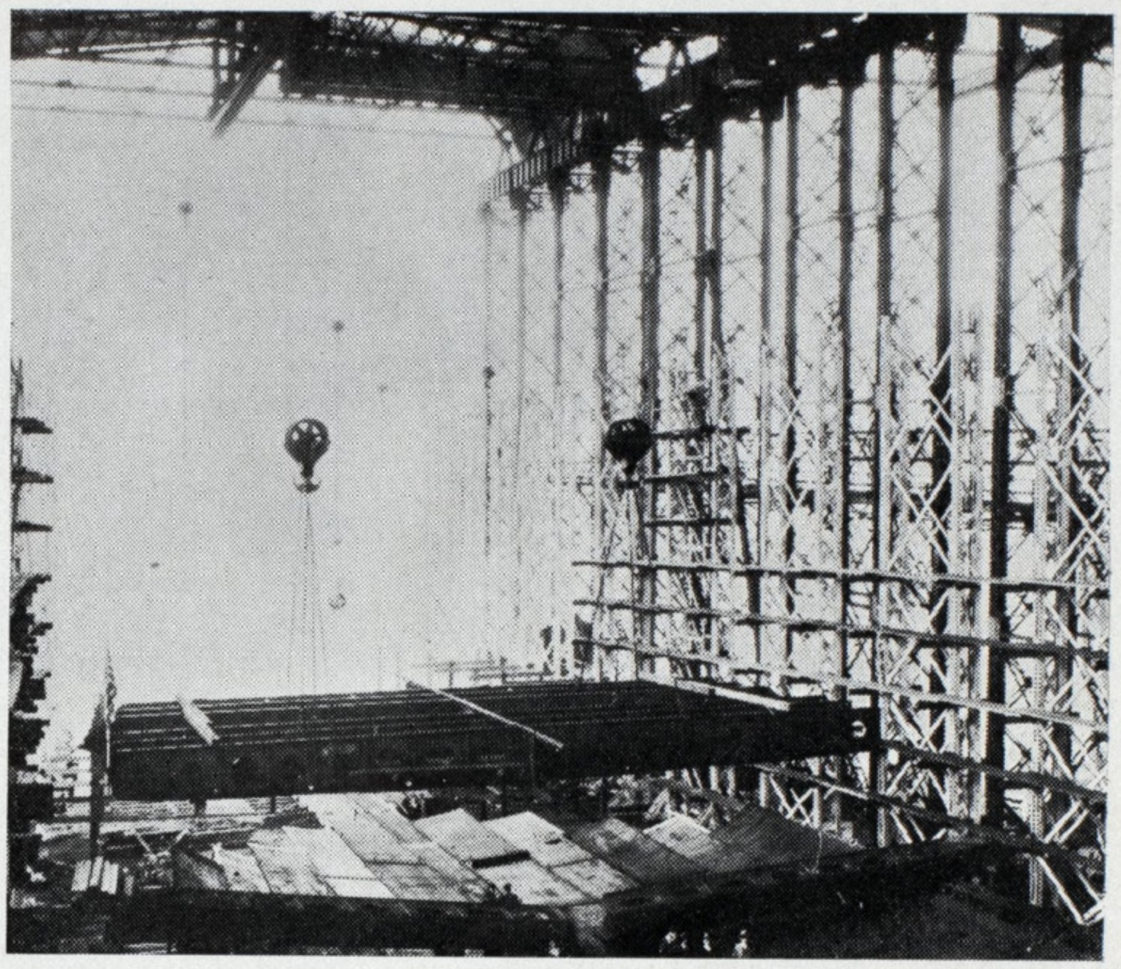


Fig. 1 (above)—Heavy duty hoisting. An assembly of floors being lowered into place on the loosely laid bottom plates

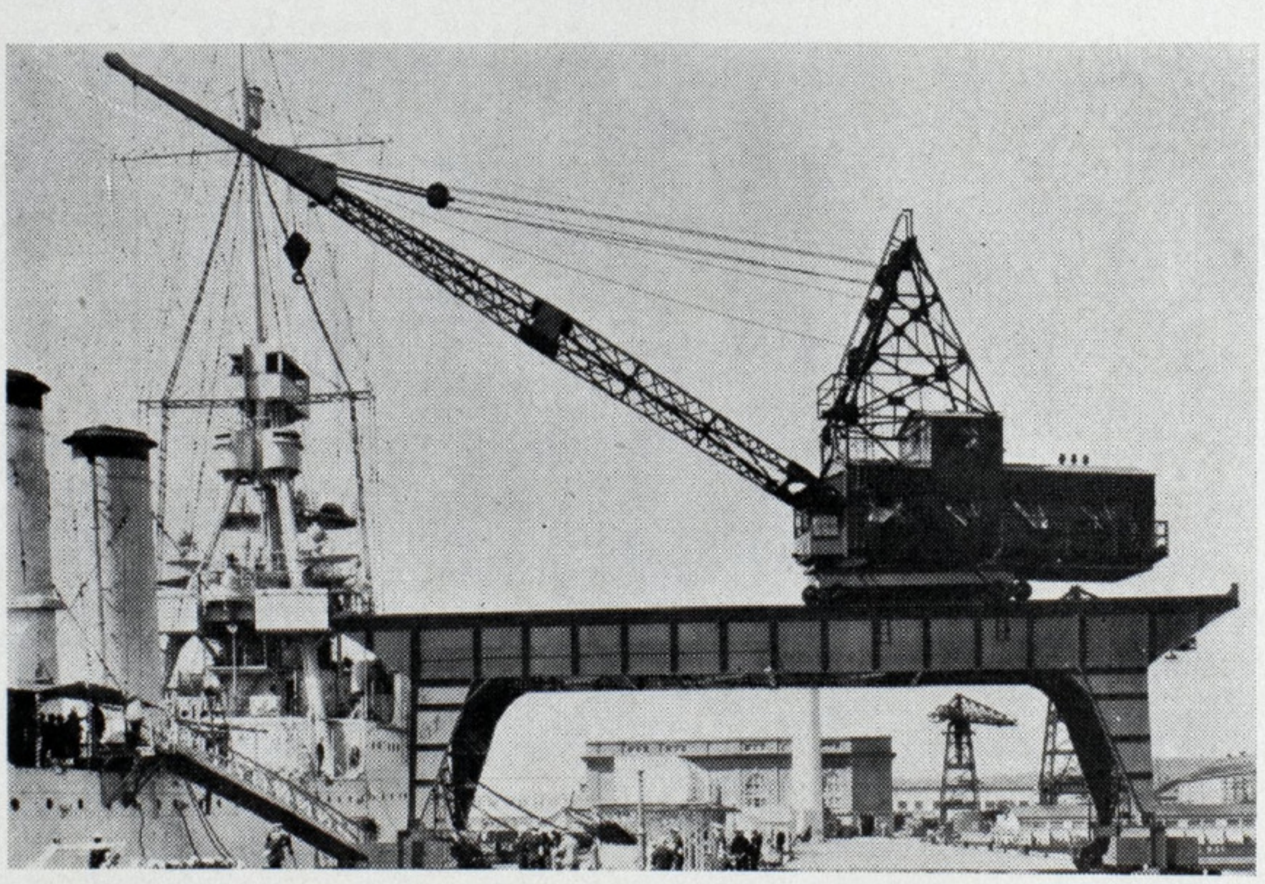


Fig. 2 (at left)—Heavy duty, traveling gantry crane with revolving boom. A typical installation on a shipyard pier for service in repairing or fitting out and completing a ship in the wet basin

Modernization will also benefit shipyard labor by improved working conditions and a greater assurance of steady work and good wages.

Better Methods and Machinery

Opportunities for modernization exist in all shipyards in this country, in varying degree. The following may be cited as typical possibilities for using modern machinery or up-to-date practices whereby increased plant efficiency and safety to workmen may be obtained.

1. Use of individual electric drive on machines in machine, piping, plate fabricating, woodworking shops, etc.

2. Scrapping obsolete machinery and substituting up-to-date machinery where required.

3. Use of modern lighting systems. Elimination of line shafting, mentioned under 1, alone contributes considerably to improved lighting.

4. Use of improved methods and machinery. A typical case is the continually increasing application of welding.

5. Full use of modern material handling equipment throughout the entire shipyard.

Each of the above suggestions have a direct bearing on complete modernization but the scope of this article will be confined to a discussion of material handling equipment in the shipyard.

It is widely recognized, though frequently not applied as fully as possible, that successful handling of materials in a shipyard calls for a steady and orderly moving of parts in production and assembly. To accomplish this objective careful study must be made of the size, weight and routing of the numerous parts entering in the construction of ships. Such a study will disclose not only the speed and capacity of material handling facilities but also any peculiarities which individual cranes, hoists or conveying equipment must possess. Assistance from experts qualified to deal in material handling problems is often of great value in pointing out a better way of handling special cases.

Crane Duties Changed

The advent of new materials, construction methods and machinery has in many instances changed the duty imposed on existing cranes and

---

The author, W. C. Raube, is a member of the staff of the Industrial Engineering Department, General Electric Co., Schenectady, N. Y.

hoists. In the earlier days all shipbuilding materials used in the construction of a ship were, with a few exceptions, of relatively small tonnage and were delivered to the ways to be assembled and worked into the ship's structure.

Today it is common practice to do a great deal more assembly work in the shops with the result that the pieces delivered to the ways are generally heavier and of larger dimensions. It is now not unusual to fabricate complete bulkheads in the assembly shop and deliver them to the ways where heavy duty cranes are required to carry them out over the ship's hull and lower them into proper position to permit fastening in place. Many existing cranes are, therefore, inadequate for such new duties and should be replaced with heavier cranes or reconditioned for heavier duty.

However, there still remains the need for considerable relatively light duty hoisting service in the construction of a ship. A typical case is the handling of workmen's tools and supplies. To handle such materials and other light weight parts on the heavy duty cranes is not only uneconomical but very often inconvenient, tying up important heavy assembly work and also causing delay because of the unsuitability of the equipment for such service. The proper method would be to use supplementary cranes which operate on independent track systems. It should be possible to operate the light duty cranes without interfering with the operation of the main heavy duty cranes and thereby expedite ship construction. Heavy duty hoisting is shown in Fig. 1 with an assembly of floors being lowered into place.

An alternative arrangement of providing light duty or auxiliary crane service is to provide rails secured to the sides of the steel trusses, on either side of the slip, for carrying removable wall type cranes. These cranes need to be in operation only during such periods of construction of the ship as would warrant the service of such light duty cranes. When these auxiliary cranes are not required on one slip they may be used at other slips or placed in storage. The reach of such wall cranes need not be more than sufficient to land loads over the side of the ship for possibly 70 per cent of the ship's length. It is important, however, to be able to travel the entire length of the slip so as to be able to pick up materials delivered to the storage area at the shore end.

After the ship has been launched and moved to the wet basin to receive its machinery and equipment, a wide variety of crane service is required. Some of the equipment is placed on board before leaving the ways and sometimes even the major part of the machinery. The extent to which this can be done depends on a number of considerations including the possibility of strain and distortion due to excessive stresses during the launching operation.

The piers at the wet basin should be equipped with heavy duty traveling gantry revolving boom cranes. These cranes must be sufficiently elevated to permit swinging the largest piece of machinery over the side of the ship and then lower it into the ship's hold. Specially constructed booms may be used on the revolving cranes in order to give increased clearance over projections from the ship.

Wide gage track facilities should be provided for these gantry cranes to permit moving the crane back and forth with minimum interference to other uses of this pier. Standard railroad clearances should be maintained underneath the traveling bridge support for the gantry so that railroad shipments may be delivered directly to the pier and unloaded by the crane without rehandling. Fig. 2 shows a typical installation of this type of crane.

Handling Materials in Shops

The problems of efficient handling of materials are not confined to the building ways and piers. Extensive handling of materials is necessary in other departments of the shipyard, such as the machine shop, pipe shop, plate fabricating shop, foundry and storage yards. The material handling problems in these locations are much the same as in machine shops and fabricating plants in industrial plants and can largely be served with overhead cranes, swinging wall cranes, monorail hoists and conveyors. Special hoisting equipment may be worked out to good advantage in plate and pipe shops for feeding materials to plate bending, rolling and welding machines.

Movement of miscellaneous materials between stock rooms and various parts of the shipyard may be greatly facilitated by the use of trucks and tractors, elevating platform type electric or gasoline trucks and trailers.

On account of the flexibility and low maintenance, electric power has been universally accepted for operating material handling equipment. In most cases electric energy is purchased and is delivered to the shipyard in the form of alternating current, usually at high voltage. The high voltage power is then stepped down through suitable transformers to lower voltages, in which form it is used on a great deal of the electrical equipment in the shipyard, including many of the cranes and hoists. Some of the electrical energy, however, is converted to direct current for use on special machine tools and some cranes and hoists.

Use of Alternating Current

While direct current has been extensively used in the past for operating cranes and hoists in shipyards, there is today a marked tendency toward greater use of alternating current for this purpose. This has been made possible by the development of reliable mechanical load brakes by crane manufacturers. A mechanical load brake makes it possible to obtain speed control in the lowering direction as well as in the hoisting direction. It is possible, therefore, in considering any new shipyard facilities, to use alternating current operated cranes, thereby taking advantage of the inherent lower cost of alternating current electrical equipment and also to reduce the capacity of converting equipment.

This is not to say, however, that direct current equipment has failed

(*Continued on Page* 32)

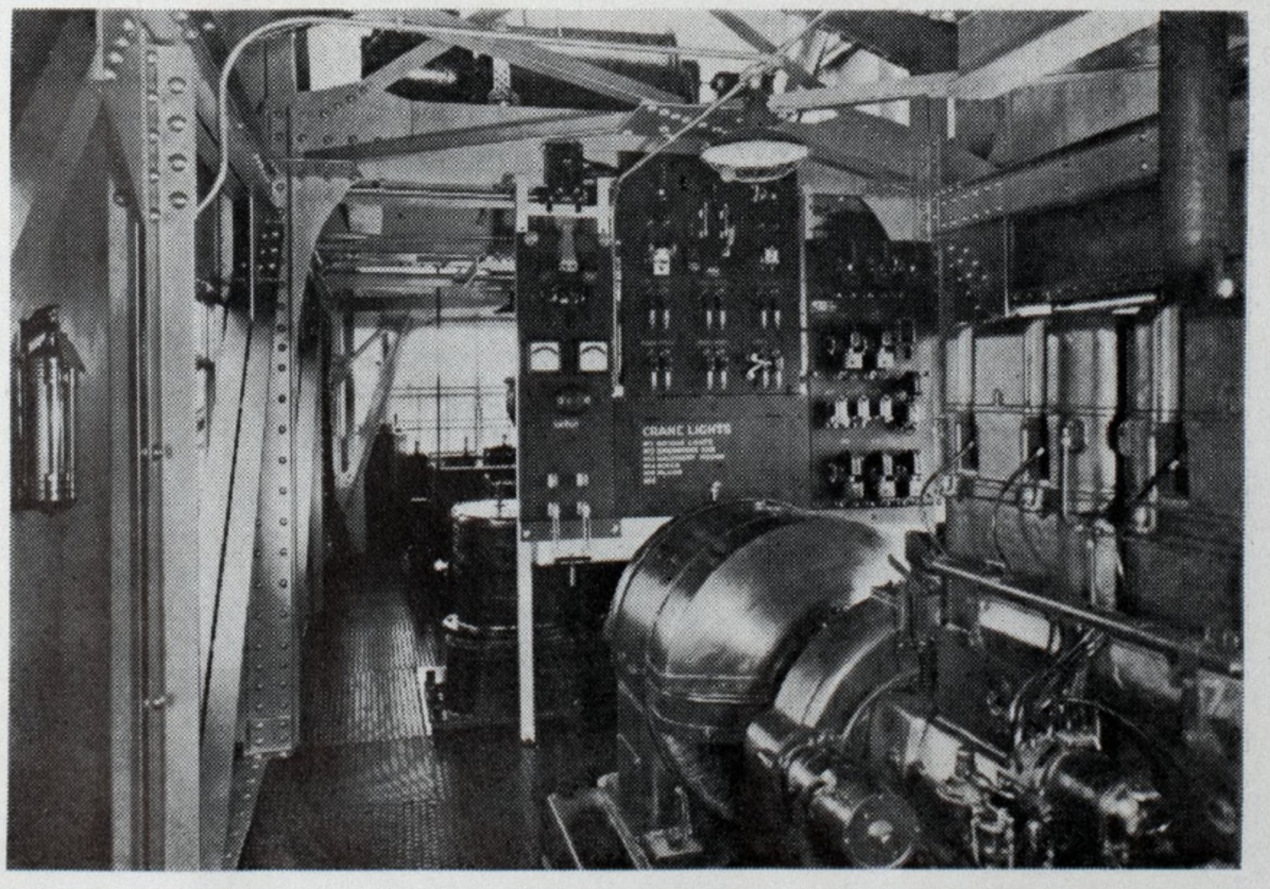


Fig. 3 (at right)—Self-contained power unit of the gantry crane shown in Fig. 2. A gasoline engine driving a direct current generator supplies electric power to the various motors for operating the crane

LIFEBOAT RACE,

American Crew Wins Ninth Annual Event

VIEWED by more than 150,000 persons, the lifeboat crew, of the Standard Shipping Co. tanker, W. C. TEAGLE, won a victory over seven rivals, representing five nations, in the ninth annual international lifeboat race, held on the Hudson river, on Sept. 2. The winning time was 18.22 minutes, five seconds over the S. S. WASHINGTON crew of the United States lines, which came in second. The third place was also taken by an American crew — the S. S. QUIRIGUA of the United Fruit line, coming in at the finish line 16 seconds later. The course began at a point off Spuyten Duyvil and finished at the George Washington bridge, a distance of two miles.

Eight Lifeboats Entered

Entries in the race, in addition to the three mentioned, included lifeboat crews from the Italian liner REX which came in fourth; the Furness-Bermuda liner, QUEEN OF BERMUDA, fifth; the North German Lloyd liner, EUROPA, sixth; the Dutch motorship, SALAWATI of the Nederland Steamship Co., seventh; and the Hamburg-American liner HAMBURG, eighth. Several other intended entries were unable to compete because their ships did not arrive in time for the contest.

When the first international lifeboat race was held in New York in 1927, with eleven boats entered, representing seven nations, the boats were all of different shapes, sizes and weights. Even before the start, it was evident that the crews in the larger boats had no chance of winning. It was the first modern lifeboat race for crews of all nations, however, and much was learned by the international committee in charge. In that race Norwegian crews from the liners SEGUNDO and TITANIA won first and second places respectively.

After this race, rules and regulations were formulated. It was decided that the smallest boat allowed to enter would have to be at least 26 feet long, with a 7-foot beam, this being considered by the committee to be the most practicable size for a boat that would necessarily be used at sea to travel between one ship and another in case of an emergency and still be a safe, efficient lifeboat.

In 1928, there were ten entries, but only eight of the crews started. This race was won by the crew of the Cunard liner MAURETANIA; with the crew from the Swedish-American liner SPARRENHOLM second; and the crew from the United States liner PRESIDENT HARDING third. The distance in this race was one mile and there was no open water between the first three boats to finish. In 1929, the course was charted in the Hudson river and the distance was increased to two miles. Crews from the Norwegian liners AMERICANO and SUD CUBANO won first and second places respectively, while the American crew from the S. S. REPUBLIC came in third. In 1930, only four boats actually started in the race and again a Norwegian crew, from the STAVANGERFJORD, won first place, finishing in 13 minutes, 48 seconds, probably the fastest two miles ever rowed in a lifeboat weighing 5500 pounds with crew and ballast. This was a world's record and still stands.

The course for the fifth race, in 1931, was changed to the Bay Ridge channel off the Brooklyn shore. Out of fifteen boats entered, representing eight different nations, the crew from the Norwegian-American liner BERGENSFJORD won. The sixth race, over the same course, won by a Norwegian crew of the same line for the third time, gave to this line permanent possession of the William H. Todd trophy.

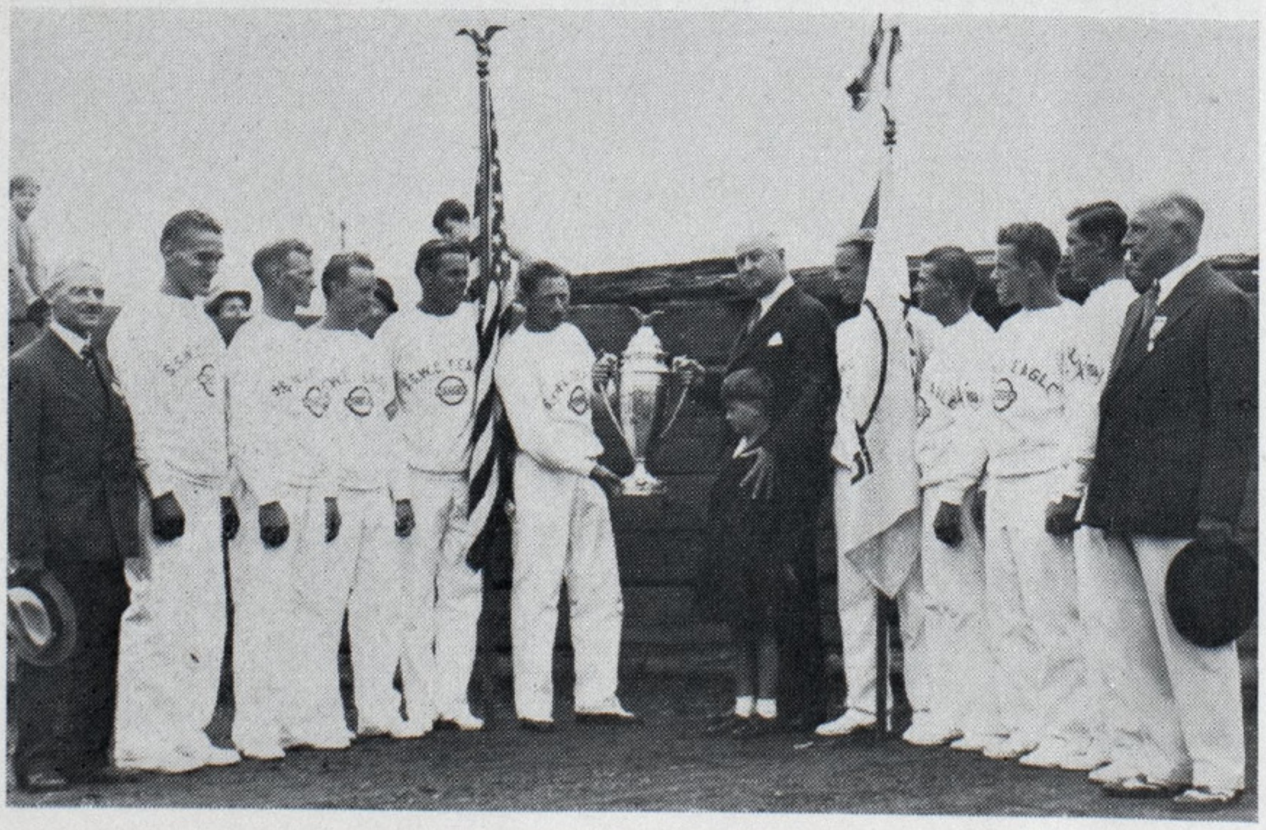
Trophy Donated by Hague

With the Norwegians gaining possession of the Todd trophy, Robert L. Hague provided a new cup for the contest and the seventh annual race, over the Bay Ridge course, was won by the crew of the W. C. TEAGLE of the Standard Shipping Co., being the first American crew to win the event.

Last year the course was again changed, this time to the Hudson river, north of the George Washington bridge. The crew from the Italian liner CONTE DI SAVOIA was victorious, winning by ten lengths, the W. C. TEAGLE crew finishing second.

The purpose of the annual international lifeboat race is solely in the interest of safety of life at sea. Expenses, which are considerable, are

ABOVE—Lifeboat of the Standard Shipping Co. tanker W. C. TEAGLE *nearing the finish line and victory*



AT LEFT—Postmaster General James A. Farley presenting the Robert L. Hague Trophy to the winning crew of the tanker W. C. TEAGLE. *This is the second time the Teagle's crew has won the cup. John D. Reilly, head of Todd Shipyards Corp., and President of the International Lifeboat Racing association, is standing at the right, and Robert F. Hand, vice president of the Standard Shipping Co., at the left*

Start of the Ninth Annual International Lifeboat Race on the Hudson river, Labor Day, Sept. 2, 1935

borne by the steamship companies to encourage a spirit of sportsmanship and skill in lifeboat operation on the part of their crews from all departments, including sailors, firemen, stewards and cooks.

A number of the participating boats were built for the race since the regulations governing have become progressively strict and elaborate. In the first contest, eight years ago, there were no limits on weight, size and appointment, with the result that the race became a walkaway for the lightest, least cumbersome craft.

Today each boat with crew and ballast must weigh not less than 5500 pounds; its length must be not less than 25 feet, 11 inches, nor more than 28 feet, 1 inch; its greatest breadth not less than 26 per cent of its length; and its depth not less than 42 per cent of its breadth. There may be no outriggers or slides, nor may the keel be greased with graphite.

A committee, known as the inspection committee, composed of representatives of three non-competitive organizations — one from the United States bureau of navigation, one from the American Bureau of Shipping and one from British Lloyd's — sees to the observance of these rules.

Loadlines Will be Enforced, Required by New Law

In accordance with terms of the loadline bill, passed at the last session of congress and signed by the President on Aug. 27, loadlines indicating the maximum depth to which vessels may be loaded are to be applied to coastwise and Great Lakes vessels of more than 4000 gross tons within 3 months and for vessels of 150 to 4000 gross tons within 12 months after the date of approval.

Authorization is given to the secretary of commerce to give consideration to and make differentials for the various types and characters of vessels and the trades in which they are engaged, provided, however, that no loadline shall be established or marked on any vessel which gives a lesser freeboard and less buoyancy than the international load line.

Certificates will be issued to vessels, setting forth the markings of the vessel, and these certificates must always be on board during a voyage. The drafts forward and aft must be noted in the log before departing from the loading port. Vessels believed to be overloaded may be detained in port by any collector of customs until they have been properly marked or reloaded.

For violation of the new law, a penalty of $500 may be imposed on the owner or master of any vessel; also a fine of $100 may be imposed for failure to make proper entry in the log of the position of the markings. Violation of detention orders may be punished by a fine of $500 or imprisonment for three months, or both. Concealment, removal or defacement of the loadline marks may be punished by a fine of $1000 or imprisonment, or both.

Passenger Travel Heavy

As additional information supporting the statement made by the shipping board bureau in a recent survey (see page 14) that this year was one of the best travel seasons since 1929, the following figures are quoted:

The REX of the Italian line arrived in New York, Aug. 29, from Naples, Genoa, Nice and Gibraltar, with 1806 passengers, and on another trip, arriving in New York on Sept. 7, from the same ports, she carried 1575 passengers. The Italian liner ROMA, returing from a cruise of the Mediterranean, also bringing passengers from Italy, Nice and Spain, arrived in New York Aug. 22 with a passenger list of 1328.

Breaking the record of her arrival on Aug. 29, the North German Lloyd express liner BREMEN arrived in New York Sept. 16 with 2055 passengers, the largest number carried on any steamer, eastbound or westbound in the past three years.

The EUROPA of the North German Lloyd line arrived in New York from Bremen, Southampton and Cherbourg on Aug. 22 with 1626 passengers on board.

The REX of the Italian line arrived in New York, Sept. 21, from Genoa, Nice, Naples, and Gibraltar with 1757 passengers.

Safety Congress to Meet In Louisville, Oct. 14

The twenty-fourth annual safety congress and exposition of the National Safety Council Inc., 20 North Wacker drive, Chicago, will be held in Louisville, Ky., on Oct. 14 to 18.

The program of the marine section has been prepared by a committee headed by E. W. Fiske Jr., of Socony-Vacuum Oil Co. Inc., New York City. Robert F. Hand, of the Standard Shipping Co., New York, is vice-chairman in charge of posters and slides, while Arthur M. Tode, consulting marine engineer, New York City, is vice chairman in charge of publicity. A. O. Woll, of the General Petroleum Corp., California, is vice-chairman for the Pacific coast. John S. Hunter, of the Atlantic Refining Co., Philadelphia, is secretary.

Sessions of the marine section will open Tuesday morning, Oct. 15 and will continue through Thursday noon, Oct. 17. Mr. Tode will open the session with an address of welcome. A review of the year's activities will be given by the general chairman, E. W. Fiske Jr., followed by an address by G. O. Griffin, safety director of The Dravo Contracting Co., Pittsburgh.

Other addresses to be presented before the marine section on Tuesday Oct. 15, are as follows: *"The Underwriter's View of a Marine Safety Program,"* by J. J. Santry, manager of the personal injury department, United States P. & I. Agency Inc., New York city; *"What Safety Means in the Shipyard,"* by A. Albert Giese, staff super-

(*Continued on Page* 29)

MOHAWK DEMOLITION,

Hulk Cut Down to Safe Navigation Depth

BY LIEUT. COL. JOHN C. H. LEE

THE demolition of the wreck of the Clyde-Mallory steamship MOHAWK has proceeded in an orderly and efficient manner since the contract was awarded on June 11.

As with all maritime salvage or wrecking operations, the project had individual characteristics which could be appreciated only by those closely associated with the actual work. When the wreck was abandoned by the steamship owner and his underwriters, it lay on its starboard side, with a list of 89 degrees, and in 12 fathoms of water, some 7 miles off Mantoloking, N. J. This abandonment by the Clyde-Mallory lines, the Ward line, as charterers, and the insurance underwriters was made official on Feb. 7, or about two weeks after the vessel sank in collision with the freighter, TALISMAN.

Authority to Remove Wreck

Shortly thereafter, authority was granted by the war department for the removal of the wreck, bids were asked and the army engineers were prepared to go ahead with removal. The vessel had approximately 150,000 gallons of fuel oil, in addition to 1278 tons of general cargo aboard when she sank. The fear that this fuel oil, released by explosives, would damage the beach resorts along the New Jersey cost, resulted in numerous protests against extreme or violent methods in the demolition of the hulk. As the vessel was resting almost entirely on her starboard side, the choice of demolition methods was limited to blowing her port side completely off, or trenching the ocean bed alongside the wreck and toppling the hulk into such a grave.

Before the award of the contract was made, however, nature took a hand. A spring gale blew out of the northeast, lasting for three days, and thereafter the coast guard, in its routine inspection of the coastal waters, reported the foremast of the MOHAWK to be projecting 15 feet above the water. The storm had almost righted the wreck, divers subsequently finding that the hulk was resting on its keel with a list to starboard of only 20 degrees.

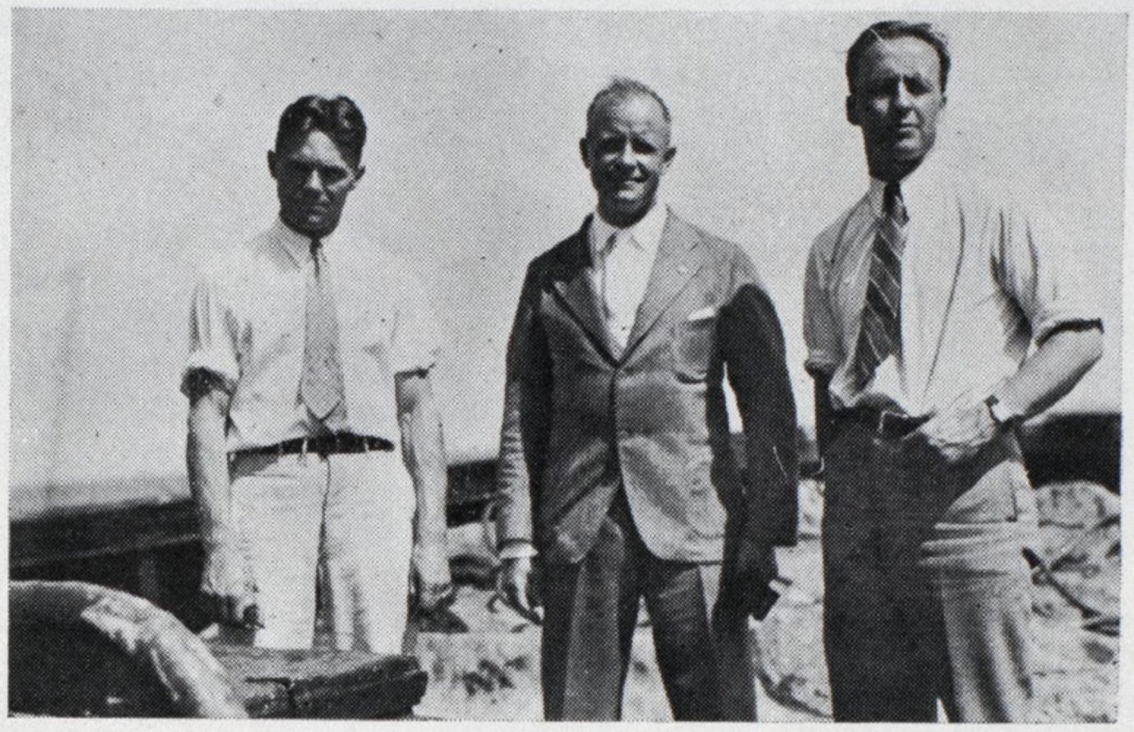
Because of the change in the vessel's position, all bids were recalled and an entirely new set of specifications written and advertised. Under the contract, as finally awarded to the Merritt-Chapman & Scott Corp., the problem of the fuel oil was solved by specifying that all fuel oil must be removed before demolition operations could be started.

No fuel oil or debris from the MOHAWK has ever reached the beaches on the Jersey coast as a result of the demolition work. Great care was taken by contractor to pump whatever oil was left in the vessel into tanks. The salvaged oil was transported to Hoboken, N. J. for disposal. Approximately 80,000 gallons of the total of 150,000 gallons reported in the MOHAWK's fuel tanks were thus pumped out by the contractor. The remainder had evidently seeped from the wreck and drifted out to the sea before operations started.

Official photographs, taken from the air, show that the oil slick, emanating from the wreck, moved northeast at all times. Splendid service from the United States coast guard station at Cape May afforded the opportunity for the district engineer to make these aerial reconnaissances.

Difficulties Encountered

The reports of John Nook and Howard Bagley, army engineer inspectors, who have lived on the job since it started, are, as a rule. dry, factual data on hours worked, oil pumped, explosives received and used. But occasionally a glimpse of the difficulties



Demolition of the wreck of the Mohawk. Lt. Col. Lee (center) with investigators from the New York District Attorney's office

---

The author, Lieut. Col. John C. H. Lee, Corps of Engineers, U. S. A., is district engineer, Philadelphia, and the demolition of the wreck MOHAWK was carried out under his jurisdiction.

Explosives on derrick boat Citizen of Merritt-Chapman & Scott Corp. used in demolishing hull of the Mohawk

facing the crew, 7 miles at sea, appears in their succinct statements of the weather.

For instance—on June 17, it was "blowing hard," according to Inspector Nook's daily report. On June 18, the report stated "wind too strong to remain at wreck. The tug RESOLUTE towed derrick boat CITIZEN back to Staten Island." He then listed repairs made to the derrick, which gave evidence of the fury of the storm!

An example of the care with which the work was carried on is also included in Nook's reports, "Diver went down to engine room, took off bonnet of suction valve and connected hose. Brought valve up so that I could be sure it was the correct valve, each valve being marked on the ship's plan."

Diver Gus Marcussen, receiving instructions as he prepares for an inspection of the Mohawk. Capt. W. H. Davis, vice president, Merritt Chapman & Scott (with hat) standing by

Charge of Dynamite Exploded

After making sure that all residue oil had been removed, preparations for demolition were made. Before using explosives, assurance that no debris or fuel oil would be washed ashore was made certain by accurate and specific weather forecasts of an offshore wind. The district engineer was present when the first, and heaviest, charge was placed in the fuel tanks of the wreck on July 30.

Approximately 1900 pounds of 60 per cent dynamite were placed by the divers, and set off electrically from a row boat, after the tug and derrick boat were removed some distance from the marking buoys. The detonation resulted in a general weakening of the entire wreck, the shattering of both port and starboard fuel tanks and the release of a small quantity of debris and fuel oil residue. The debris was picked up by the contractor's crew in small boats, and the oil drifted out to sea.

The damage to fish life, widely publicized, was extremely small. The number of fish killed by the blasting operations was scarcely more than a dozen.

Subsequent demolition by explosives proceeded slowly but steadily, the quantity of dynamite used being from 2 to less than 500 pounds at a time, and the breakage being confined to sections of the wreck above the main deck and along the promenade deck. The forepeak of the vessel had dropped off, and lay on its starboard side, before demolition operations started.

The contractor completed demolition well within the time allowed him. The wreckage was swept and the proper depth certified on Sept. 2, although the contract time was not up until Sept. 14.

Moira, All-welded, Ocean-going Tanker

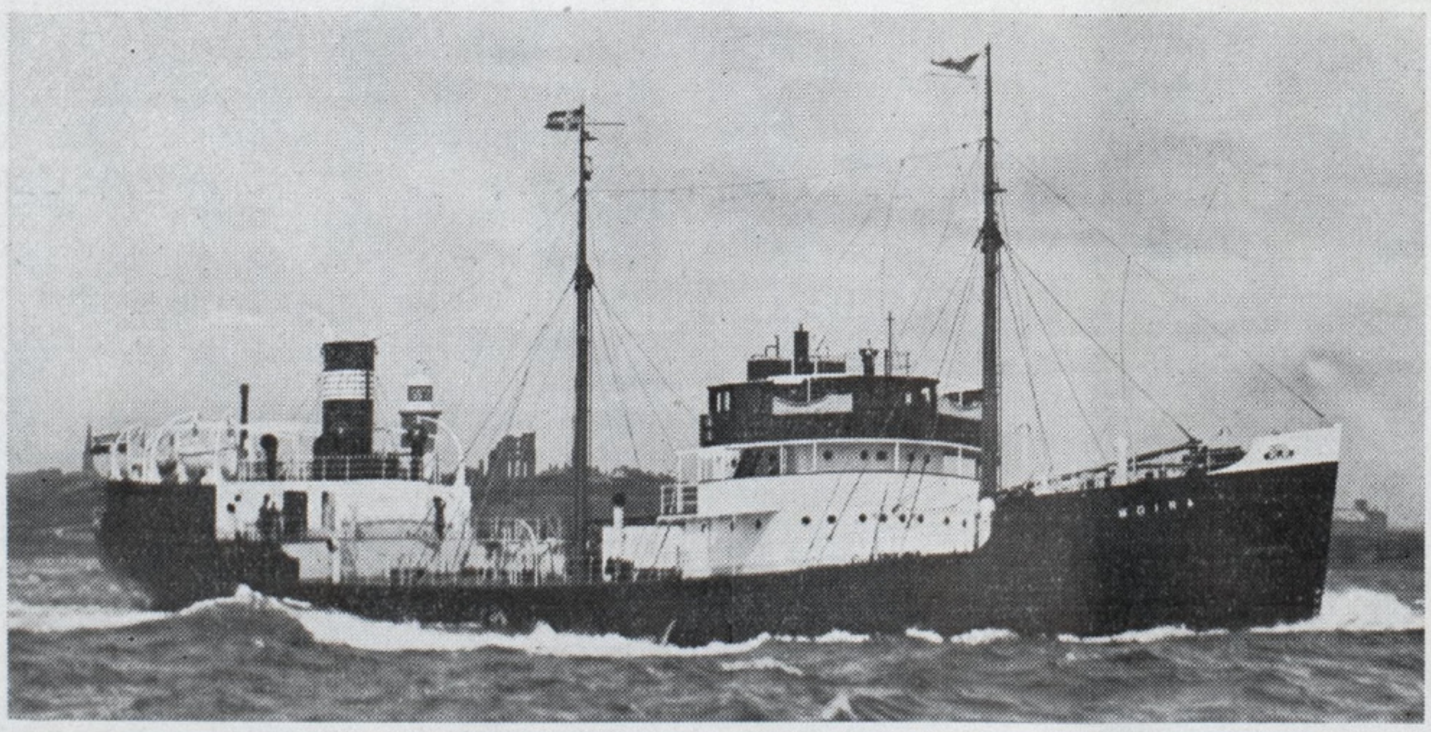
SUCCESSFUL sea trials of the all-welded, single screw, steam, oil tanker MOIRA were held off the coast of England on May 23. Built to the order of the Marna Co., Oslo, the MOIRA is 245 feet in length between perpendiculars; 257 feet in length overall; 42 feet 2 inches in beam molded; 18 feet in depth molded; and is designed for a deadweight of 2240 tons. She was built at the Wallsend shipyard, Swan, Hunter & Wigham Richardson Ltd., to Lloyd's survey for carrying petroleum in bulk and has five main oil tanks divided into ten compartments by a centerline longitudinal bulkhead.

One of the principal points of interest in this vessel is her construction throughout entirely without riveting. The whole structure is secured by electric welding and she is the largest all-welded ocean-going ship built up to that time in Great Britain. The cargo tanks are constructed without internal stiffening leaving a perfectly flush surface to facilitate easy drainage and cleaning.

A special installation of apparatus for cleaning the tanks, known as the Arnesen patent, is fitted and consists of a telescopic tube fitted on the crown of each tank. This tube has an inner tube which can be lowered and turned. Two swiveling arms attached to the lower end of the inner tube are fitted with sprayers which enable the cleaning fluid to reach all the internal surfaces of the tanks. This provides an effective and rapid cleaning method.

Another feature of interest in the MOIRA is the propelling machinery, which is placed aft and consists of a compound reciprocating steam engine working in conjunction with a Bauer-Wach low pressure exhaust steam turbine. This type of propelling power has proved to be both economical and dependable in operation. The machinery was constructed at the Neptune Engine works.

On the sea trials the MOIRA attained a speed in excess of 10 knots. She was built under the supervision of Arnesen Christensen & Smith Ltd., Oslo, and Newcastle-on-Tyne.



Moira, all-welded tanker—reciprocating engine, Bauer-Wach exhaust turbine

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

CLAUSES in bills of lading requiring notice of damage to goods to be given within a limited time are always upheld by the courts, if they are reasonable, it was said in the case of GEORGIAN, 76 F. (2d) 550. The purpose of the clause is to allow opportunity to the vessel to investigate the claim for damage while witnesses are available, and before it is otherwise too late, in order to defend against an exaggerated or fraudulent claim. Under a clause requiring notice of damage to be given in writing to a vessel's agent within a specified time after removal of goods from custody of the vessel, with a proviso that notice of apparent damage must be given before removal of the goods, verbal notice by a surveyor, to the chief mate who made an entry in the vessel's logbook showing the damage to the cargo was a substantial compliance with the clause, as against the contention that notice in writing should have been given to proper agents of the vessel. A vessel's logbook is perhaps the most important document among her papers, and the owner is bound by entries made therein by the ship's officers. It may be conclusively presumed, said the court, that the chief mate would not have made the entry unless he believed it to be true. He was the agent of the vessel for the delivery of the cargo and a proper person to be notified, and notice to him and the entry in the logbook constituted notice to the vessel and her owners that the cargo was damaged and gave them full opportunity to make an investigation as to the extent of that damage.

* * *

A WRECK is a "vessel" within the federal law permitting the owner to institute proceedings for limitation of liability.—CENTRAL STATES, 9 Fed. Supp. 934.

* * *

WATERS navigable in fact for trade or commerce are navigable in law, and this includes canals and other waters privately owned or claimed. The question of navigability arose in the case of LUCKY LINDY, 76 F. (2d) 561, in connection with the issue whether an admiralty court had jurisdiction, and it was held that a canal cut through private property and used by motor, oyster, and fishing luggers of 10 tons or less, on payment of toll limited to professional fishermen, was navigable water and that admiralty and maritime jurisdiction attached.

* * *

A VESSEL does not become a vessel of the United States entitled to the privileges of vessels employed in the coasting trade or fisheries until it is, in fact, enrolled, though built and owned by citizens of the United States.—In re Penglase Sand & Gravel Co., 76 F. (2d) 593.

* * *

STEAMSHIP lines take the risk on shipping aliens without immigration visas, or quota immigrants with nonquota visas. A steamship line admitting into the United States aliens having forged reentry permits are subject to fine, though the carrier exercised diligence and the forgery could not have been detected, where the aliens admittedly had no immigration visas. A carrier is not entitled to rely alone upon a birth certificate presented by an alien or upon any official identification, but is bound to make its own inquiries and is chargeable with whatever matters examination would disclose, where the carrier transports an inadmissible alien to the United States.—Navigazione Generale Italiana v. Elting. 76 F. (2d) 885.

* * *

ALL vessels used successively in performing a contract are not to be deemed one vessel for the purpose of surrender in limitation of liability; vessels to be surrendered are those devoted to performance of the contract at the particular time when the fault which causes the loss is committed.—GEORGE W. PRATT, 76 F. (2d) 902.

* * *

SUBMARINE of the United States navy damaged in collision had a value as a serviceable war vessel in excess of its value as junk, it was held in the case of L—1, 10 Fed. Supp. 43, notwithstanding the fact that this value was potential and required the expenditure of money to make it available to the owner, and the fact that the owner subsequently determined not to spend the necessary money, it being shown that the submarine if reengined and reconditioned would have been worth more than the cost of the reengining and reconditioning. "In other words," said the court, "the owner had a margin of value in the vessel which it could realize by spending some money. Whether the margin was large or small is immaterial. The damage done by the collision impaired this marginal value. The owner is entitled to have it restored by the wrongdoer, and the cost of necessary repairs is the proper measure of recovery." In computing the damages for the injury, measured by reasonable cost of repair, shop overhead may properly be included though repairs were actually never made.

* * *

THE case of MANHATTAN, 10 F. Supp. 45, involved a libel for damages to a dredge owned by the United States caused by collision, the dredge sinking and later being raised and repaired. The court held that allowance of interest on money spent at usual rate was a proper exercise of discretion, the government not being in a special class by reason of its ability to borrow money at lower rates, or for any other reason; that interest allowed should begin to run from the time the money was spent and not from the date of the sinking of the dredge; that if period between sinking and final recommissioning causes specific damage, it may be recovered as item of damages separate from interest; that cost of removing the wreck as derelict cannot be added to the government's recoverable damages; that in absence of statute, the owner of a sunken vessel has the right to abandon her and thus entirely absolve himself from liability for damages caused by obstruction of a channel; that the burden on the government to remove a sunken vessel is exactly the same whether the vessel is government owned or privately owned, or whether it was sunk by wrongful act or accident.

Marine Business Statistics Condensed

Record of Traffic in Foreign Trade at Principal American Ports

New York

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	485	2,410,727	509	2,547,739
July	507	3,261,057	510	2,308,106
June	446	2,123,325	457	2,169,623
May	338	2,059,686	476	2,194,913
April	460	2,823,172	460	2,297,895
March	424	2,151,900	454	2,240,198
February	368	1,846,603	384	1,813,244
January	412	2,069,982	440	2,131,740
December, 1934	424	1,928,702	401	1,896,182
November	412	1,834,078	427	1,944,737
October	429	2,080,505	413	2,027,222

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	150	493,296	153	500,731
July	141	444,659	141	445,471
June	143	448,611	140	474,146
May	149	455,196	157	494,182
April	158	473,766	148	464,016
March	144	453,643	140	449,186
February	102	312,963	119	384,859
January	105	336,019	116	376,343
December, 1934	125	396,724	127	416,978
November	118	355,338	121	355,754
October	128	391,788	142	440,734

Boston

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	201	680,434	198	656,900
July, 1935	181	554,887	178	561,651
June	153	407,049	124	344,556
May	157	503,572	160	503,808
April	122	429,195	124	457,417
March	124	447,541	126	446,456
February	104	385,520	107	394,441
January	116	445,990	114	427,402
December, 1934	121	452,109	129	479,607
November	124	447,502	115	437,062
October	127	498,892	125	500,447

Portland, Oreg.

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	25	96,598	28	107,857
July	31	120,912	33	128,518
June	26	97,369	25	92,030
May	32	121,173	31	116,738
April	29	105,011	32	115,386
March	37	143,915	37	144,379
February	41	160,445	45	175,091
January	45	157,562	45	158,661
December, 1934	40	149,728	50	187,452
November	45	175,245	45	169,005
October	48	183,575	47	182,669

Portland, Me.

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	25	36,147	23	37,308
July	18	25,596	17	22,728
June	20	31,292	20	33,342
May	15	19,747	14	21,319
April	11	27,747	11	23,129
March	10	24,475	9	21,745
February	11	23,834	12	27,693
January	12	31,676	10	25,804
December, 1934	12	24,738	16	37,026
November	21	41,916	19	34,399
October	19	34,735	17	28,611

Providence

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	3	6,253	5	7,241
July	13	31,908	9	18,779
June	6	14,226	5	10,858
May	5	13,206	6	20,240
April	6	20,333	3	6,596
March	6	20,792	4	14,033
February	5	22,152	6	25,619
January	4	12,463	7	20,586
December, 1934	1	2,316	4	13,221
November	4	9,158	4	9,005
October	4	12,988	1	1,901

San Francisco

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	160	701,896	155	680,999
July	156	692,261	163	711,768
June	153	676,557	164	703,968
May	165	734,666	168	742,901
April	161	686,156	176	707,749
March	157	684,905	163	688,194
February	100	609,987	164	669,680
January	142	638,652	162	672,411
December, 1934	152	659,210	154	628,137
November	151	664,456	175	733,150
October	152	670,992	156	663,353

Baltimore

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	114	335,421	115	337,194
July	115	331,909	126	358,513
June	115	354,647	104	318,929
May	119	356,505	116	347,292
April	104	316,476	104	331,839
March	100	293,568	107	325,453
February	85	267,417	92	291,094
January	86	276,468	88	286,810
December, 1934	97	299,281	95	309,991
November	88	271,778	94	288,109
October	96	282,930	100	308,916

Norfolk and Newport News

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	139	408,964	140	418,704
July	122	356,677	121	345,352
June	132	374,592	130	361,401
May	131	405,144	126	375,243
April	127	388,429	122	380,770
March	122	374,447	127	391,523
February	109	330,108	115	335,404
January	138	429,759	136	402,944
December, 1934	148	420,417	138	401,430
November	120	389,510	124	366,913
October	112	333,739	112	330,639

Mobile

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	46	121,935	51	133,377
July	46	118,084	46	104,915
June	42	106,832	44	123,966
May	51	135,639	43	111,836
April	40	112,784	39	106,734
March	45	109,978	46	112,995
February	41	102,099	36	91,813
January	46	129,386	48	135,215
December, 1934	43	111,212	42	106,660
November	38	96,522	39	106,495
October	45	135,301	42	123,063

Jacksonville

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	37	98,794	34	89,380
July	43	116,334	35	96,912
June	27	67,170	34	85,364
May	27	61,256	27	66,011
April	34	79,609	34	80,808
March	31	63,749	29	62,261
February	25	61,714	26	66,594
January	18	49,375	24	70,832
December, 1934	22	55,809	26	67,705
November	32	65,689	31	74,619
October	28	67,954	28	66,686

Key West

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	26	33,981	24	35,100
July	37	43,037	35	42,948
June	36	41,569	37	48,681
May	49	59,990	49	57,044
April	52	39,491	38	46,737
March	31	37,869	30	34,093
February	32	34,322	32	37,498
January	32	37,232	34	37,563
December, 1934	31	47,048	33	48,609
November	33	41,770	35	42,891
October	37	38,904	34	36,799

New Orleans

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	200	500,771	194	480,056
July	197	542,700	183	476,305
June	184	502,937	191	499,413
May	183	482,299	195	484,065
April	188	504,227	173	465,173
March	183	474,712	173	425,843
February	166	457,420	165	439,990
January	166	457,267	166	435,232
December, 1934	172	472,463	174	477,672
November	157	431,288	157	430,060
October	175	499,832	177	492,802

Los Angeles

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	255	876,566	230	866,383
July	233	856,769	233	815,544
June	255	837,279	201	812,904
May	265	908,224	294	908,788
April	214	807,692	209	824,533
March	248	978,707	232	932,392
February	203	782,886	196	788,189
January	199	773,531	196	771,662
December, 1934	239	899,269	222	882,697
November	226	870,032	210	878,186
October	225	856,732	203	825,348

Seattle

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	35	152,315	40	178,621
July	34	157,607	31	139,816
June	34	154,707	36	162,266
May	35	148,801	39	163,880
April	47	200,067	50	206,729
March	42	182,384	47	202,641
February	48	211,876	47	203,927
January	56	212,386	63	249,805
December, 1934	51	222,427	47	201,642
November	46	185,293	48	205,795
October	54	230,438	55	222,014

Galveston

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	53	151,762	53	149,692
July	67	195,763	66	190,599
June	82	227,942	82	238,144
May	78	221,243	77	208,359
April	76	208,534	75	208,775
March	72	197,624	70	188,227
February	66	195,014	66	188,027
January	60	177,183	62	178,500
December, 1934	66	183,518	63	177,125
November	73	204,939	76	266,065
October	79	228,912	78	227,822

Houston

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1935	86	384,617	82	296,738
June	78	301,106	74	281,068
May	78	283,922	74	258,121
April	64	234,916	60	210,474
March	64	232,928	65	218,169
February	60	210,483	53	175,387
January	71	232,409	68	217,910
December, 1934	45	159,040	47	166,241
November,	39	143,055	39	139,616
October	43	145,461	41	139,418
September	49	169,676	49	170,694

Charleston

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1935	13	31,026	11	27,263
July	13	35,019	6	21,658
June	20	59,452	12	35,629
May	16	39,756	14	34,209
April	20	48,434	8	20,276
March	15	33,456	8	23,807
February	16	42,673	16	39,011
January	20	54,969	13	34,125
December, 1934	10	25,512	14	34,304
November	16	44,046	10	26,675
October	17	47,331	13	33,850

Note: This table gives number and net tonnage of vessels entered and cleared in the foreign trade, direct and via other domestic ports.

Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Sales—Reconditioning—Launchings—Trial Trips

BIDS on two 62-foot harbor craft, to be built for the United States coast guard, were received on Sept. 3. George Lawley & Son Corp., Boston, was low bidder at $50,710 each, for two boats, with Winton engines. Award had not been made as this is written.

On Sept. 18, bids were to be opened by the coast guard for building two or three 65-foot patrol boats, for delivery on the Atlantic coast, at Norfolk, Va., or any Atlantic port north thereof; and on Sept. 24, for the construction of two or three 65-foot patrol boats, for delivery on the Pacific coast at San Francisco, or any Pacific coast port south thereof.

Wood Patrol Boats

The United States coast guard also received bids on Sept. 10 for building three, four or five 80-foot wooden patrol boats for delivery on the Atlantic or Gulf coasts, or the Great Lakes; and bids were to be received on Sept. 19, for constructing two, three or four similar vessels for delivery on the West coast.

Lowest bid received Sept. 10 of $28,900 each, for three, four or five boats, was submitted by the Gibbs Gas Engine Co., Jacksonville, Fla.

55-Foot Harbor Craft

Bids are also to be received on Oct. 1 by the coast guard for building three, four, five or six 55-foot vessels, for delivery at any port on the Atlantic or Gulf coast, or the Great Lakes, and on Oct. 4 for building two 55-foot vessels, for delivery on the Pacific coast.

Lay Keels for Two Cutters

Construction of two coast guard cutters was initiated at the New York navy yard, Sept. 11, in simple keel-laying ceremonies, the first rivets being driven by Rear Admiral Yates Stirling Jr., U.S.N., commandant, and Capt. Charles A. Dunn, U.S.N., industrial manager of the yard. The cutters are to be 328 feet in length and of 2000 tons displacement. They will have a speed of 20 knots, fastest of their size ever built.

The new cutters, two of seven ordered by the coast guard, will cost $1,500,000 each, and will be completed about the end of 1936. Four of the seven are to be built at the Philadelphia navy yard, and one at the Charleston, S. C. navy yard. For use in rescue work, prevention of smuggling, chart and mapping operations and ice patrol, they will be capable of making extended voyages.

Approximately 5300 men are now employed at the New York navy yard in the building of two cruisers, the BROOKLYN and HONOLULU. This number will be increased as construction progresses.

Submarines are Launched

The 298-foot submarine TARPON was launched at the yard of the Electric Boat Co., on Sept. 4, Miss Eleanor K. Roosevelt, daughter of Assistant Secretary of the navy Henry L. Roosevelt, acting as sponsor. Immediately after the launching, the TARPON was towed to the outfitting docks.

The TARPON is a sistership of the SHARK, launched at the same yard on May 22 and now being prepared for trials. The new submarine has a displacement of 1315 tons, Her keel was laid on Dec. 22, 1933

Three more submarines of similar type, the PLUNGER, PINNA, and POLLACK are under construction at this yard, and are scheduled for launching next year. Contracts for building three additional submarines were awarded to the same yard on Sept. 9.

The PIKE, sistership to the recently launched submarine PORPOISE, was launched on Sept. 12, at the Portsmouth navy yard. Miss Jane Logan Snyder, daughter of Rear-Admiral Charles P. Snyder, commandant of the yard, was sponsor. Before the ceremony, Miss Snyder received a gold wrist watch from the yard workmen.

Construction of the PIKE was authorized June 1, 1933, and her keel was laid on Dec. 20, 1933. She will be ready for service about May, 1936.

Building Wooden Drydock

The first pontoon of the five-section, 15,000-ton, wooden drydock under construction by Todd Seattle Dry Docks Inc. is soon to be launched. The work is being done by day labor and 175 men will be employed until early in 1936, when the new dock will be ready for service. This floating dock of special V bottom type has been designed by Frederick R. Harris, drydock engineer, New York.

The total length of the new dock will be 521 feet, with a breadth of 127 feet and a depth over the keel blocks of 26 feet. It will replace a 468-foot, 12,000-ton steel dock, built in 1912 by the Seattle Construction & Dry Dock Co. The old dock, no longer fit for service, was sold to the Puget Sound Navigation Co., and is now being used as a breakwater at one of its terminals.

Experience of the Todd officials at Seattle has convinced them that wood is preferable to steel in drydock construction. One advantage is the flexibility of individual wood pontoons, whereby the docking surface can be adjusted to the requirements of any particular job. Some 5,000,000 feet of Douglas fir will be used in building this dock. Submerged portions of the pontoons will be creosoted.

Completion of the new dock will give the Seattle Todd plant two 15,000-ton units and a third dock of 2000-ton capacity.

The new tug CHESTER, built for the United States engineers, Philadelphia, was launched recently at the plant of the Alabama Drydocks & Shipbuilding Co., Mobile, Ala. The cost of this vessel is to be approximately $50,000. The CHESTER is 65 feet, 6 inches long, and is fitted with a Winton diesel engine developing 235 horsepower. A Kohler electric generating set is installed.

Start Work on Cruiser

The keel for the 10,000-ton treaty cruiser HONOLULU was laid on Sept. 10 at the New York navy yard, with three rivets being driven by representatives of the navy, congress and the Territory of Hawaii.

The HONOLULU will cost $16.000,000, of which $12,000,000 will go for construction and $4,000,000 for armament and other equipment. She will be 600 feet long, 64 feet in beam, and will have a draft of 27 feet. Her armament will include fifteen 6-inch guns, an anti-aircraft battery and catapults for launching planes, as well as small squadron of planes.

Bids are to be received until 3 p.m. Oct. 25 by the United States engineer office, Milwaukee, Wis., for the construction and delivery afloat of one new steel hull and house for dredge KEWAUNEE.

The fifteenth fall meeting of the American Welding Society is to be held at Chicago Sept. 30 to Oct. 4. A large attendance is expected.

Sun to Build Two Tankers For Gulf Refining Co.

The Sun Shipbuilding & Dry Dock Co., Chester, Pa., has received an order from the Gulf Refining Co., for the construction of two tankers. They are to be built to Isherwood arcform design and on the Isherwood bracketless system.

Dimensions of the new tankers are: 440 feet in length overall, 425 feet in length between perpendiculars; 64 feet in breadth molded; and 34 feet in depth molded. The draft loaded will be 27 feet, 6 inches. The cargo capacity on this draft is to be 85,000 barrels (476,850 cubic feet) or about 12,000 tons. Adding to this figure, 800 tons for bunker fuel and 400 tons for water, stores, etc., the approximate deadweight will be 13,200.

Definite decision on machinery had not been reached by Sept. 16 and it was said it would probably be two weeks before this question was finally settled. Both turbine and diesel machinery have been under consideration. The speed is to be 12 knots which is a little better than for the usual commercial tanker.

The vessels are to be classed in the American Bureau of Shipping.

Polish Liner Pilsudski

The new Polish motorship, PILSUDSKI, first transatlantic liner to be built for that nation since regaining its independence, sailed from Gdynia on Sept. 15 on her maiden voyage, due to arrive in New York on Sept. 24, making the run in 8½ days. She is unique in that she is the first vessel built with the tourist class as the de duxe accommodations on board.

The PILSUDSKI is the first vessel in history to have been built strictly on a barter basis. Together with her sistership, the BATORY, now under construction, the PILSUDSKI is being paid for with 1,200,000 tons of coal to be shipped by Poland to Italian railways over a five-year period.

Principal particulars of the new vessel are: Length overall, 513 feet, 4½ inches; length between perpendiculars, 492 feet, 11 inches; breadth molded, 70 feet, 6½ inches; depth molded, 37 feet, 6 inches; draft loaded, 24 feet, 9 inches; displacement loaded, 15,000 tons; gross tonnage, about 14,700; passenger capacity, 760, of which 355 will be in tourist and 405 in third class. The cargo capacity is 5100 tons, or 180,000 cubic feet bales. Speed is 18 knots.

The propelling machinery is two, twin screw diesel engines of Sulzer type, built in Italy, each engine having nine cylinders and developing 6250 brake horsepower at 130 revolutions per minute.

Two Destroyers Launched

The United States destroyers CONYNGHAM and CASE, contracts for which were awarded in August, 1933, were launched on Sept. 14 at the Boston navy yard. Miss Muriel Rogers Case, 14-year-old great-granddaughter of Rear Admiral Augustus Ludlow Case, Civil war commander-in-chief of the United States navy, of South Orange, N. J., christened the CASE, while Mrs. Alice Conyngham Gifford Johnson, Sedalia, Colo., great-great-granddaughter of Capt. Gustavus Conyngham, Civil war officer, sponsored the CONYNGHAM. Instead of sliding down the ways, both ships were launched by the filling of the drydock in which they were built.

Senator David I. Walsh, of Massachusetts, in an address to the 5000 people attending the launching, emphasized the need for a "Navy and air force second to none which will be amply adequate to protect our shores and our homes from invasion".

Rear Admiral Walter R. Gherardi is commandant of the Boston navy yard and the first naval district.

The United States engineer office, Louisville, Ky., will receive bids until 2 p.m., Oct. 11, for furnishing and installing a watertube boiler on the towboat CAYUGA.

Bids will be received until 2 p.m., Oct. 4, by the United States engineer office, Louisville, Ky., for the construction and delivery afloat at Paducah, Ky., one self-propelled, 20-inch, pipe line dredge.

To Build New U. S. Liner, Bids to be Requested

It is understood that every effort is being made by the staff of Gibbs & Cox, naval architects, 1 Broadway, New York, to complete plans as quickly as possible for the new cabin liner which the United States lines proposes to build for its New York, Cobh, Plymouth, Havre and Hamburg service. From time to time, the shipping board bureau and the navy department have been consulted, and it is expected that no difficulty will be experienced in obtaining approval of the final plans.

It is expected that a request for bids on the construction of the new liner will be issued sometime in October. The cost is estimated at over $11,000,000. The following shipyards are expected to bid: Federal Shipbuilding & Dry Dock Co., Kearny, N. J.; Newport News Shipbuilding & Dry Dock Co., Newport News, Va.; New York Shipbuilding Corp., Camden, N. J.; and Bethlehem Shipbuilding Corp. Ltd., Fore River plant, Quincy, Mass.

The new cabin liner, while of the same class, will be an improvement on the popular liners MANHATTAN and WASHINGTON, and will be of about 30,000 gross tons nearly 6000 tons larger. She will also be somewhat faster, a speed in excess of 24 knots being mentioned. The new vessel will be the last word in safety, as plans include the most modern fireproof and unsinkable construction throughout.

It is believed that the shipping board bureau will pass favorably on the application for a construction loan, which will be submitted by the company in accordance with the schedule called for in the revised contract. The time limit for definite action in going ahead with the building of the liner, under the terms of the contract with the shipping board bureau, was up on Sept. 18, but the revised contract calls for an extension of 90 days in which to place order.

Todd Shipbuilding Corp., Seattle, on its low bid of $6298.35 received a contract for drydocking and repairing the relief lightship of that district.

Bunker Prices

At New York

	Coal F. a. s. per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
Sept. 20, 1935	5.80@5.55	1.00	4.08
Aug. 20	5.80@5.55	1.00	4.08
July 19	5.80@5.55	1.10	4.08
June 20	5.80@5.55	1.20	4.08
May 20	5.80@5.55	1.20	4.65
April 19	5.63@5.38	1.20	4.65
Mar. 19	5.63@5.38	1.20	4.65
Feb. 19	5.63@5.38	1.20	4.65
Jan. 19	5.63@5.38	1.20	4.65
Dec. 19, 1934	5.63@5.38	1.20	4.65
Nov. 19	5.63@5.48	1.20	4.65
Oct. 19	5.63@5.48	1.20	4.65

At Philadelphia

	Coal trim in bulk per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
Sept. 20, 1935	5.10@4.85	1.00	4.04½
Aug. 20	5.10@4.85	1 00	4.04½
July 19	5.10@4.85	1.10	4.04½
June 20	5.10@4.85	1.20	4.04½
May 20	5.10@4.85	1.20	4.61
April 19	4.93@4.68	1.20	4.61
Mar. 19	4.93@4.68	1.20	4.61
Feb. 19	4.93@4.68	1.20	4.61
Jan. 19	4.93@4.68	1.20	4.61
Dec. 19, 1934	4.93@4.68	1.20	4.61
Nov. 19	4.93@4.78	1.20	4.61
Oct. 19,	4.93@4.78	1.20	4.61

Other Ports

Sept. 20, 1935

Boston, coal, per ton	$6.44
Boston, oil, f. a. s. per barrel	$1.14
Hampton Roads, coal, per ton, f.o.b. piers	$4.92
Cardiff, coal, per ton	13s 6d
London, coal, per ton	—s —d
Antwerp, coal, per ton	16s 9d
Antwerp, Fuel oil, per ton	—s —d
Antwerp, Diesel oil, per ton	—s —d
British ports, Fuel oil	—s —d
British ports, Diesel oil	—s —d

Umtata, Twin Screw Steamer, For African Service

A NEW finely modeled, twin screw, steam, passenger and cargo liner, christened the UMTATA, was launched at the Neptune yard, Swan, Hunter, & Wigham Richardson Ltd., Newcastle-upon-Tyne, England, Aug. 30. The new liner is being built to the order of Bullard, King & Co. Ltd., London, for service to Africa on that company's Natal line and the christening ceremony was performed by Mrs. Robertson F. Gibb, wife of the chairman of the Union Castle Mail Steamship Co. Ltd., and of Bullard, King & Co. Ltd.

The principal dimensions of the UMTATA are: Length overall, about 468 feet; beam, 61 feet, 3 inches; and depth molded to the upper deck, 35 feet, 6 inches. Designed for a total deadweight of 8000 tons, a trial trip speed of 15¾ knots is called for with a total of 6000 tons on board.

Refrigerated Cargo Space

The ship is being built under the special survey of, and in accordance with the latest rules of Lloyd's Register of Shipping for its class +100 A. 1. and with Lloyd's refrigerating machinery certificate. She will also comply in all respects with the requirements of the safety at sea and loadline conventions and Factory acts as well as the requirements of the British board of trade for foreign going passenger certificate.

A raking stem and cruiser stern gives her a pleasing modern appearance. There is a cellular double bottom and a semi-balanced double-plated stream-lined rudder has been fitted. The hull is divided into four cargo holds and six 'tween deck cargo spaces. The forward hold and five of the 'tween deck cargo spaces are insulated for carrying dairy produce and fruit cargoes. In addition, there are insulated cold storage places for the ship's provisions. Two complete decks run continuously forward and aft; with lower decks in Nos. 1 and 3 cargo spaces. A bridge deck is fitted amidships, with boat deck and navigating bridge above. There are also poop and forecastle decks.

Reciprocating Engines, Turbines

The propelling machinery, consisting of two sets of triple expansion steam engines each working in conjunction with an exhaust turbine on the Bauer-Wach system, is of more than ordinary significance as indicating the possibilities of the use of this type of prime mover in vessels of considerable size and power. The engines which are under construction at the Neptune Engine works of the shipbuilder are of the most modern type and will be provided with poppet valves in the high pressure cylinders.

Steam will be supplied by four boilers designed for a working pressure of 225 pounds per square inch, arranged to burn coal, with Howden's corrugated plate type of air preheaters and forced draft. Superheaters of the smoke tube type, capable of giving a superheat of 200 degrees Fahr. at the engines, are to be fitted.

Up to the present time nearly 300 sets of Bauer-Wach exhaust turbine machinery have been constructed, 60 of these at the Neptune works. The results obtained in performance have been uniformly successful, not only as regards the large saving in coal consumption, but also in connection with the general upkeep costs of the reciprocating engine and turbine.

The fitting of an exhaust turbine is the mechanical equivalent of an enormously large flywheel on the engine shaft. This has a very marked effect on the motion of the reciprocating engine, the noise and clatter associated with such engines disappearing completely as soon as the turbines are switched into action, and wear and tear largely reduced in consequence. In addition, due to the flywheel effect referred to, the tendency of the propeller to race in heavy weather is almost entirely prevented and this results in an improvement in the ship's speed. This feature has been especially stressed in numerous reports which have been received from time to time during the last seven years.

Auxiliary Machinery Steam

Deck machinery and its arrangement are in accordance with the most modern practice, for the rapid and efficient handling of cargo. Nine steel tube cargo derricks have been fitted, eight of which are rigged for lifts of five tons and the remaining derrick on the fore mast for lifts of 20 tons. These derricks are served by eight, 7 x 12 inches, steam driven cargo winches, and there is also a warping winch on the poop deck.

The windlass is steam driven and the steam steering gear is of Wilson Pierre type with telemotor control. For electric lighting there are two steam driven generating sets and a diesel driven emergency plant.

The refrigerating plant consists of one horizontal duplex steam-driven machine supplied by J. & E. Hall, with two double acting compressors, duplex water circulating pump, two electric brine pumps and one electric brine thawing pump. Each refrigerated cargo space is separately cooled by air circulation over batteries of brine cooling pipes, each battery provided with a high efficiency propelling fan coupled to an electric motor. For cooling the provision room two methyl chloride electric marine type refrigerating plants are installed.

Passenger Accommodations

Accommodations are to be provided on the bridge and upper decks for 100 one class passengers. The dining saloon and entrance are located on the upper deck and the lounge, smoking room and veranda cafe are on the bridge deck. These public rooms will be attractively decorated in polished hardwood, with comfortable and pleasing furnishings. Special attention has been given to the selection and arrangement of the furniture.

The staterooms on the bridge deck are arranged for two passengers. On the upper deck the outer staterooms are arranged for two passengers and the Bibby staterooms for three passengers. The arrangements and furnishings of the staterooms follow modern lines, including metal cot beds, open wash basins with running hot and cold water, and mahogany furniture.

The captain and officers are berthed in a deck house on the boat deck. Quarters for the engineers are located on the upper deck and the crew space is in the poop 'tween decks.

The auxiliary machinery of this vessel, like the main engines, has been selected with the view of obtaining the most economical results in service operation. The electric generators and some of the other auxiliaries are arranged to operate on superheated steam. Two-stage feed heaters are installed, the first stage utilizing auxiliary exhaust steam, while the second stage is supplied with steam bled from the main engines. When the refrigerating plant is operated under full load conditions, a certain amount of exhaust steam will be available over and above that which can be utilized in the first stage heater, and an automatic arrangement is provided whereby this surplus is lead to the exhaust turbine inlets, with a resulting improvement in overall economy.

The lubrication system consists of three steam-driven pumps, two of which are normally in operation, working in conjunction with a system of gravity tanks.

Baltimore Ranks Second In Volume of Imports

Imports at Baltimore during 1934 totaled 3,142,147 tons, the second American port in the volume of foreign inbound cargo. Among the leading commodities were: 1,222,683 tons of iron ore, 623,726 tons of petroleum products, 138,375 tons of sugar and 220,117 tons of bulk molasses. Woodpulp and pulpwood discharged at Baltimore amounted to 191,654 tons; pyrites shipments, 154,361 tons; and manganese and manganese ore, 172,036 tons. Other leading imports included potash, nitrates, paper and manufactures, bananas, coconuts and copra, pigments and chemicals, rubber and coffee. Miscellaneous imports in smaller tonnage included corn, barley, oil seeds and vegetable oils, cocoa, tobacco, wool and manufactures, hides and skins, clay, gypsum, copper and logs and lumber.

The total of exports at Baltimore was 636,379 tons, consisting of 361,226 tons of iron, steel and manufactures; and 42,789 tons of copper and manufactures. Other export cargoes for the year included 32,738 tons of phosphates, 55,096 tons of pigments and chemicals, 7197 tons of fertilizers, 9452 tons of petroleum and products, 5028 tons of cement, 36,425 tons of coal and coke, 6959 tons of wheat and 1331 tons of oats. Miscellaneous export freight included shipments of corn, wheat flour, oil cake and meal, vegetable products, fish and dairy products, fruits and nuts, tobacco, cotton manufactures, machinery and vehicles.

Baltimore's exports and imports during the year moved to countries on every continent. They were handled by 31 steamship services, in addition to large fleets of industrial carriers and many tramp vessels.

Becomes Director of Sales

Well known in the marine field for his work as designer and patentholder of fire-resisting panelling, some of which was installed on the S. S. WASHINGTON, James R. Fitzpatrick was recently appointed director of sales of the technical division of the Algoma Plywood & Veneer Co., Algoma, Wis., with headquarters for sales, research and engineering service at 1616 Builders building, 228 North LaSalle street, Chicago. Mr. Fitzpatrick, formerly connected with the Haskelite Mfg. Corp., recently resigned as vice president in charge of sales, a position he had held during the past twelve years.

One of Mr. Fitzpatrick's recent developments is a new type of panel for marine use which has a steel face. Panels of this type are now being installed on the two steel tankers under construction for the Standard Oil Co. in the Federal Shipbuilding & Dry Dock Co. yards.

Lighthouse Service Aid

Formerly chief engineer of the lighthouse service, Charles A. Park was sworn in on Aug. 23 at the department of commerce at deputy commissioner of lighthouses. He will take up his new duties immediately as principal assistant to H. D. King, commissioner of lighthouses.

Mr. Park first entered the lighthouse service at Detroit, Mich., headquarters for the eleventh district, in 1911. In 1924 he became superintendent of this district, and served in this capacity until Sept. 1, 1933, at which time he was transferred to Washington as chief engineer.

He takes up his new duties with a well rounded experience, of 24 years of continual service. For 9 years he was in charge of the exceptionally important and progressive eleventh district. He holds a degree in civil engineering from Ohio State university where he graduated in 1907, and is a member of the honorary scientific society Sigma Xi.

A. Colden Deyo Dies

A. Colden Deyo, 47, vice president of the Todd Mobile Dry Docks Co., a subsidiary of Todd Shipyards Corp., New York, died at his home in Mobile, Ala., on Aug. 29.

Mr. Deyo was a native of New Platz, N. Y. He received his schooling in that city, and in 1902 became connected with the Todd Shipyards Corp., with which company he remained until his death.

Prior to his appointment as vice president of the Mobile plant in 1931, he was vice president of Robins Dry Dock & Repair Co., Brooklyn, for five years.

Shipyard Strike Ends

Operations at the New York Shipbuilding Corp., Camden, N. J., were resumed when 3600 employes returned to work on Aug. 29 after a strike which began on May 13. They returned under terms of an agreement reached after the intervention of President Roosevelt.

A decision is to be reached within 60 days by an arbitration board of three members appointed by the President. Both the company and the Industrial Union of Marine and Shipyard Workers of America have agreed to abide by the decision.

Safety Congress to Meet

(*Continued from Page* 21)

visor of the personnel division, Newport News Shipbuilding & Dry Dock Co., Newport News, Va.; and "*The Essential Features of Safety Cooperation in the Marine Industry*," by Capt. Henry Blackstone, safety engineer, United States P. & I. Agency Inc., San Francisco.

On Wednesday, Oct. 16, the following addresses will be presented: "*Some Aspects of the Law Contributing to Increase in Injuries and Compensation Costs*," by J. Newton Rayzor, admiralty attorney, Houston, Tex.; "*Safety at Sea*," by J. B. Weaver, director of the United States bureau of navigation and steamboat inspection; and "*The Results of Marine Safety Program on the Pacific Coast*," by Byron O. Pickard, manager of the Accident Prevention bureau, Pacific Coast Marine associations, San Francisco. Data on the 1934 safety contest will be given by Mr. Fiske, and presentation of awards will be made by an officer of the National Safety council. Election of officers will also take place at this session.

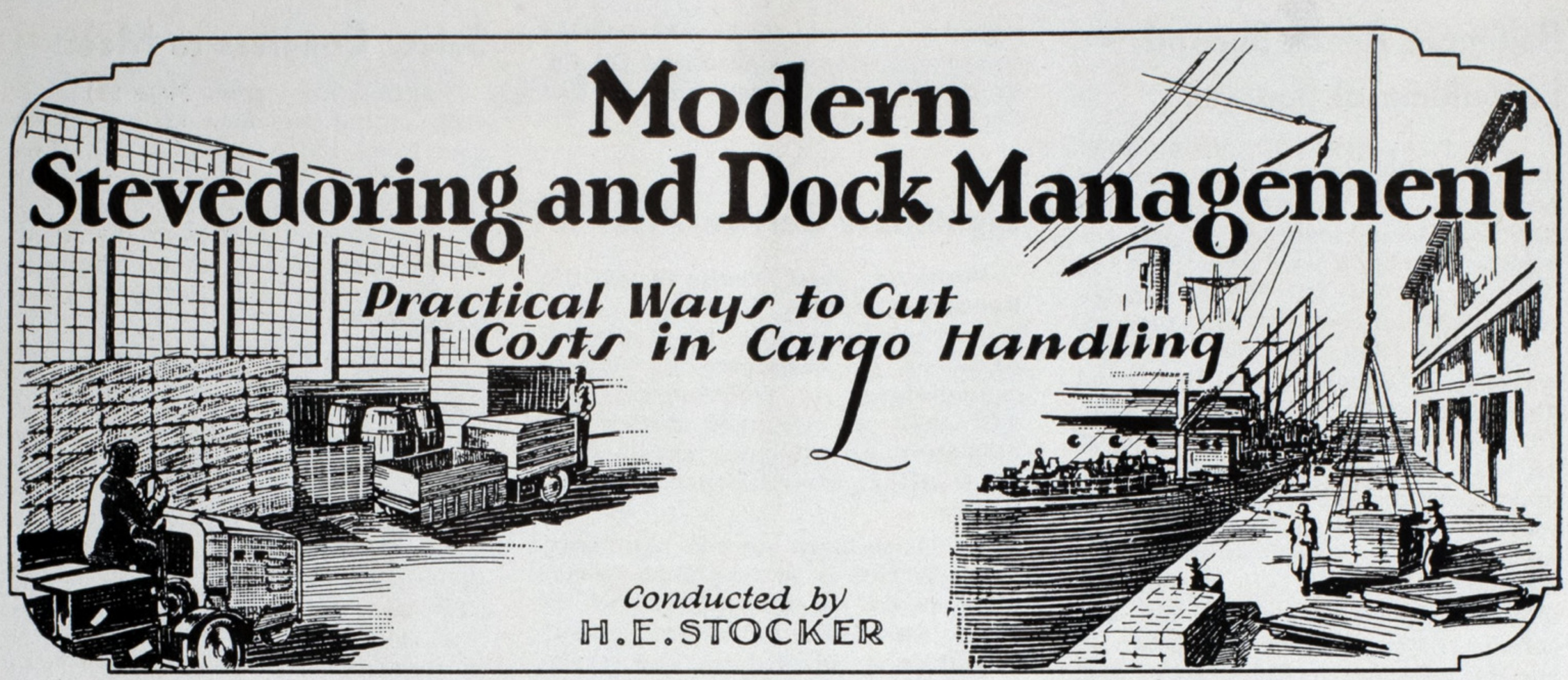
On Thursday, Oct. 17, the addresses will include "*The Promotion of Safety in the Design and Construction of Ocean Going Vessels*," by David Arnott, chief surveyor of the American Bureau of Shipping, New York city; "*Safety Features of Operation on Inland Waterways*," by Garratt S. Wilkin, special representative of the Inland Waterways Corp., New Orleans, (this address will be illustrated by talking motion pictures); and "*The Application of Safety in the United States Navy Yard*," by Lieut. Commander W. P. Biggs, U. S. N. R., navy department safety engineer, Washington.

The closing address will be delivered by Robert F. Hand. All sessions of the marine section will be held in the Brown hotel.

Passenger Conference

The Transatlantic Passenger conference is scheduled to hold its regular semi-annual meeting in London, Oct. 3. The conference, composed of virtually all foreign and American passenger steamship companies operating from Atlantic coast ports of the United States and Canada, has no matters of special importance to consider, and will deal only with routine subjects.

Although all of the carriers have enjoyed the best transatlantic passenger year since 1929, it is expected that plans to attract still more travelers next year will be given attention. Whether or not the rating and classification of passenger fares on the Cunard White Star liner QUEEN MARY to enter service next June, will be discussed at this meeting could not be learned.



Terminal Time Reduced to Minimum

By General Cargo Line on Lakes

By C. L. Bruno

THE Minnesota Atlantic Transit Co. operates a fleet of six steel ships known as the poker fleet, between Buffalo, Detroit and Duluth, Minn., offering a four day service between Duluth and Buffalo.

The ships are named the ACE, KING, QUEEN, JACK, TFN and NINE and are of 1615 tons net, with the exception of the NINE which has a net tonnage of 2015 tons. Included in this total tonnage are two refrigerator spaces, one of 250 tons capacity which is known as the "sharp freezing unit" where perishable goods are kept at a temperature of zero degrees, and the other of 500 tons capacity known as the "cooler unit" where products are kept at a temperature of 36 degrees.

These refrigerator units are situated 'tween decks while the lower hold is used for the loading of the bulkier cargo such as flour.

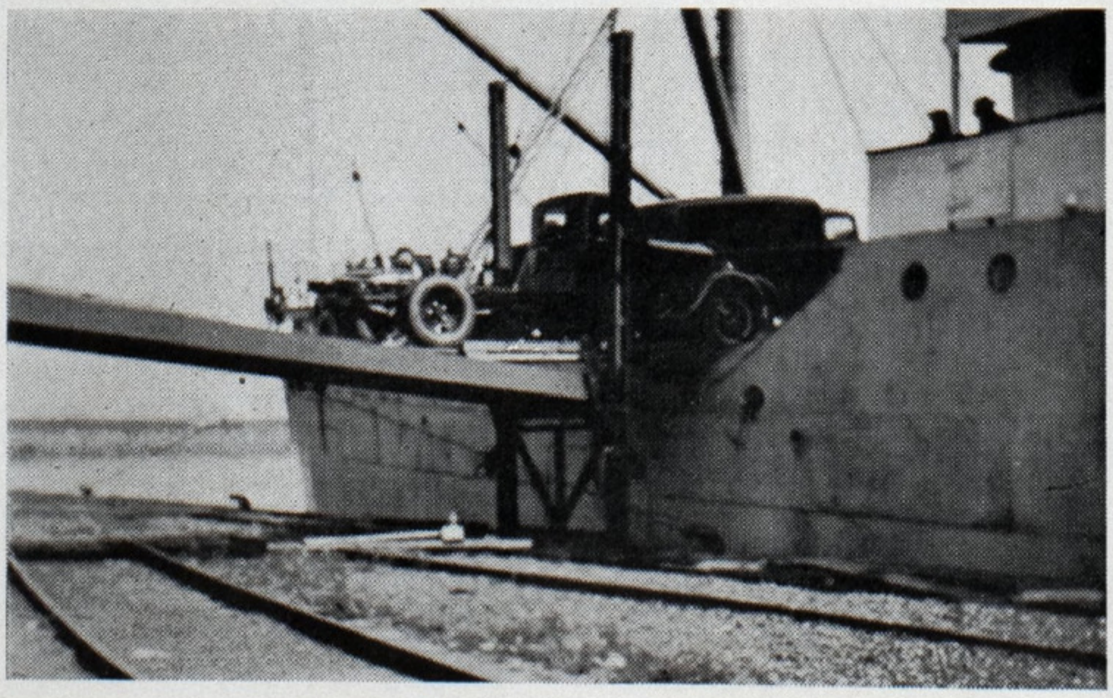
Decks for Automobiles

The deck space on these ships is for the loading of automobiles which are picked up at Detroit on the run down from Duluth. The NINE is of the usual lake type construction and is used exclusively for the transportation of automobiles, not only on her decks but in her hold. The other five ships, of the shipping board Lake type, carry automobiles on the fore and after decks, but may also stow a few in the 'tween deck space if necessary. In the summer the autos on the deck are secured by putting them in gear and setting the brakes, while in the fall, the wheels are also blocked with dunnage to prevent damage in heavy weather.

On the five shipping board built ships, there are eight hatches between the 'tween deck and the lower hold. These hatches are located one on each side of the four side ports.

The lower hold and 'tween deck space is practically all filled at Duluth, and only the autos and a few odds and ends are picked up at Detroit, which is the only port of call on the way down the lakes. On the upbound trip the ships are loaded at Buffalo, practically to their full capacity.

At Buffalo, where the operation of loading and unloading the ships was observed by the author, hand trucks and skid racks or trays are used entirely, while at Duluth there is in addition to the hand trucks, some mechanical equipment.



Unloading tracks at the dock of the Minnesota Atlantic Transit Co. at Buffalo Terminal

Care in Storage

The dock facilities at Buffalo consist of two units. The inner or shore end of the dock consists of a storage unit. Here the dock is six stories in height. Included in this area are six "sharp freezer" units where the temperature is kept at zero. Here poultry, butter, and canned eggs are stored. These units may also be cooled down to a temperature of 15 degrees below zero for the storage of powdered milk. There are in addition, 13 "cooling units" where the temperature is kept at 30 degrees for the storage of cheese, eggs in the

shell and other dairy products.

Each product, whether it be in barrel, box, crate or can, is stored with intervening space between each unit so that each separate package may be fully refrigerated. In other words, the only place in which a package comes in contact with another package is at the top or bottom, when the goods are tiered, the four sides having a small space for ventilation between it and the next package, this space continuing throughout the length of the entire pile of units. There is a circulating unit in each of these refrigerated rooms, which keeps the cold air uniform throughout the storage space.

The refrigeration for the "sharp freezers" is obtained by ammonia, while a brine mixture is used for the "cooling" units. The whole is supplied by a single pump room in the center of the dock.

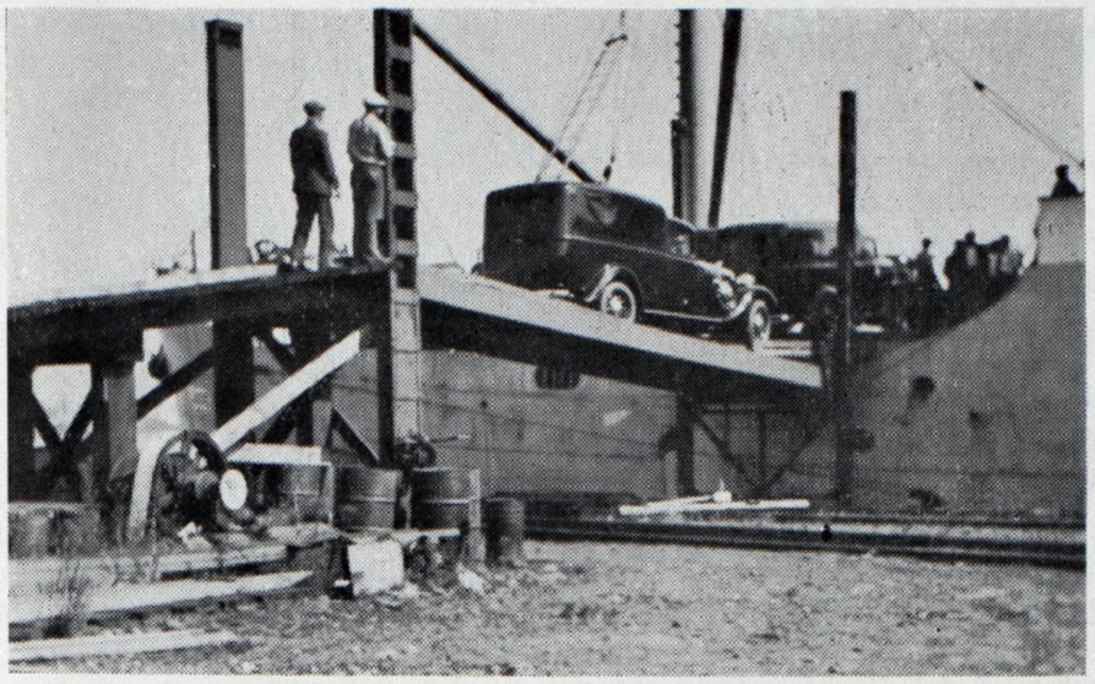
The storage space on the shore end of the dock is broken up only by the double row of columns supporting the floors above. The floors themselves are of concrete, which facilitates trucking movements, as it offers a smooth surface.

The transportation within the building is performed by means of a Ford tractor and 100 trailers, 75 of which are equipped with automatic couplers. In addition to the tractor and trailers there are 400 hand trucks used on the shorter hauls. An elevator system is provided to carry cargo between the floors.

The shed on the outer end of the dock is a single floor unit, 540 feet long and 85 feet wide. There are two rows of columns 25 feet on centers, which break the space up into 22 bays on either side of the shed, all of which are numbered. On both sides of the shed there are 10 automatic jack-knife doors spaced fifty feet on centers to allow for the spotting of cars. The floor is a well laid hard wood floor most suitable for hand trucking. On the north side there is a ten-foot loading platform completely covered by a small roof. Adjacent to this there are three railroad spur tracks, running parallel to the building for the full length of it. These tracks are operated by the Lehigh Valley railroad.

Four Mechanical Elevators

On the south side of the shed there is a twenty-five-foot open space along which the ships are berthed. At four of the doorways corresponding with the ship's ports, there are four mechanical elevators, to be raised or lowered to meet the level of the port as the ship is unloaded or loaded. Two of these elevators are equipped with a single tooth conveyor, or escalator, to assist in trucking in or out of the ship when the gangplank is at a steep grade.



Automobile unloading platform at the dock of the Minnesota Atlantic Transit Co. at Buffalo

Two other facilities worthy of note are the automobile unloading platform on the outer end of the dock, beyond the shipside shed, and the six sets of booms on the inshore portion of the dock, situated on the storage section of the building. The latter are for loading or unloading heavy articles that can not be lifted by hand or trucked.

Upon the arrival of a ship, it is first berthed at the outer end beyond the shipside shed, alongside of the automobile unloading platform. The forward deck of the ship is first unloaded then the after deck. The automobiles are driven off under their own power.

The ship is then warped down to the shed and the package freight unloaded. The four side ports are lined up opposite the mechanical elevators and work is begun by the 225 men. A gang of men working in between decks load either directly on the hand trucks or else load the hand truck trays of which there are 150. These trucks are then wheeled out to the mechanical elevator where the single tooth cog catches on the under part of the truck, and pulls it up the incline. At the top the men are directed to the proper bay, to which they take their load. This haul is seldom more than 100 to 125 feet, and is often just the width of the shed or 85 feet.

The spur tracks are filled three deep with the cars, spotted to the best advantage. On the outer tracks are the refrigerator cars which are loaded with the dairy products which are first taken out from 'tween decks. This unloading may take two hours or more after which the cars, which have been previously iced, are pulled out, and the lower holds are then unloaded. The cargo is raised to 'tween decks by means of a rope or canvas sling. The parcels are then placed upon the trucks in the same manner as the dairy products and taken over to the cars.

The material for storage on the dock is placed in bays designated for this purpose and anything that has to be kept under refrigeration is trucked to the refrigeration units by means of the Ford tractors and trailers.

The loading of the ship is carried on in a slightly different manner, in that the cars bringing outgoing cargo are spotted opposite the storage end of the building, and the ship is warped down to this point for the loading.

Minimum Time in Port

With the quick efficient system of unloading, it is easily seen why only 6 hours are needed for the work. Operating on this schedule, the ship spends but 12 hours in loading and unloading, and together with a 12 hour layover during the night, she is in port but 24 hours out of every five days, or 20 per cent of the time. This is an excellent example of the terminal time principle since the terminal time of the ships is reduced to a very low figure permitting them to operate with maximum efficiency during the short operating season.

To Hold Marine Exhibition

The Maritime association of the port of New York is sponsoring a second annual Marine exhibition, to be held at the Maritime Exchange building, 80 Broad street, New York, Nov. 12 to 20.

Over forty exhibitors have engaged display space, and it is anticipated that by the opening day, the number of entrants will well exceed one hundred.

Among the groups who will have meetings at the exhibition are the Society of Naval Architects and Marine Engineers; the Propeller Club of the United States; the American Steamship Owners' association; the Foreign Commerce Club; Marine Square club; representatives of foreign steamship companies; and representatives of various federal and municipal departments identified with shipping. These groups will meet on separate, designated days, each being addressed by prominent speakers.

Angelo R. Risso, chairman of the committee on promotion and organization, anticipates a large attendance and much interest in the exhibition.

Modernization

(*Continued from Page* 19)

to give desirable crane operating characteristics. On the contrary, direct current permits the use of series motors and the well known dynamic braking control for speed control lowering for hoists and shunted armature control connections for creeping speed on bridging, trolleying and slewing motions.

No doubt direct current will continue to be used on special hoists where alternating current does not lend itself so readily to the special service in hand. The point to be noted, however, is that in the majority of instances sufficiently accurate control may be obtained with the alternating current equipment and its use reduces the first cost of such new equipment appreciably.

Self-Contained Power Plant

In the case of many traveling gantry, revolving boom, fitting out cranes, especially where designed with a track system to permit movement to a number of piers, it is desirable to provide a self-contained power plant in the crane. This procedure eliminates collector wires or rails otherwise required to bring electrical energy to the movable structure. By eliminating such collector systems there is no danger of workmen coming in contact with live rails or of fouling the boom or swinging load with live wires. The crane shown in Fig. 2 is equipped with a gas engine driven direct current generator, shown in Fig. 3, for supplying direct current to the various motions of the crane.

The use of direct current generators for such special cases not only permits the use of dynamic braking and shunted armature control as described above, but further allows the generator to be designed with a special drooping voltage characteristic so as to make it impossible to stall the gasoline engine. Special provision must, of course, be incorporated to absorb excessive pump back current that may be obtained under certain combination of control operations and which the gasoline engine itself is unable to take care of. This feature may be incorporated in the specially designed electrical equipment for such cranes.

Better Methods Available

In conclusion it may be said that every shipyard in the country would benefit by a careful review of material handling methods and equipment in order to determine where inefficient or obsolete equipment is being used with the view of replacement or reconditioning. It is safe to say that in every case where such a review is made, better methods will be found to meet material handling problems and expenditures on modernization can be justified. The government shipbuilding program alone warrants immediate action in this respect and further justification lies in the fact that it is not unreasonable to expect that merchant shipbuilding will again be revived long before the naval program has been completed.

Twin Screw, Tunnel Stern, Survey Boat Completed

THE extensive program now under way by the United States engineers in the upkeep and development of our inland waterways has required the building of a considerable number of craft of various types. One of the most recent of these is the survey boat SERGEANT PRYOR, shown in the accompanying illustration. This vessel was built by the Dubuque Boat & Boiler Works, Dubuque, Ia., for the Missouri river division of the United States engineers, Kansas City, Mo.

The design of this boat, prepared by A. C. Landwehr, naval architect of the Missouri river division, represents a departure from usual practice in that the upper works are semi-stream lined with no overhanging roofs on any deck. This reduces wind resistance and makes the vessel easier to handle.

The SERGEANT PRYOR, launched on Aug. 16 and completed Aug. 26, is now in use for towing and survey work on the Missouri river in the Omaha district from Rulo, Neb., to Sioux City, Ia.

Of twin screw, tunnel stern construction, the hull is of steel with the main deck house, cabin and pilot house of wood. Her length overall is 80 feet, 6 inches; length between perpendiculars, 80 feet; breadth molded, 24 feet; depth molded, 5 feet; draft loaded, 3 feet, 2 inches; displacement loaded, 125 tons; and gross tonnage, 154. There are accomodations on the main deck for a crew of eight men, and in the upper cabin, for eight passengers.

The speed in still water is 10¼ statute miles per hour. The hull is divided into 17 compartments. The bunkers have a capacity of 2500 gallons of diesel fuel oil. Other tanks have a capacity for 800 gallons of engine cooling water and 300 gallons of culinary water.

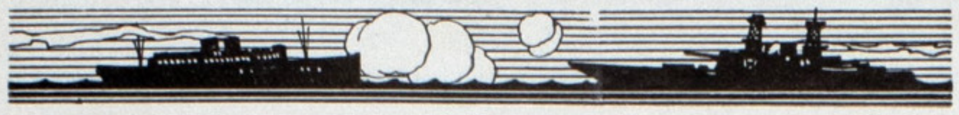
Propelling machinery consists of two Fairbanks, Morse & Co., five-cylinder diesel engines, 8¾ x 10½ inches. Each engine develops 125 horsepower. There is also one 12½-kilowatt, 20-horsepower Fairbanks Morse diesel driven generator set.

Included in the auxiliary equipment are: Two pumps, furnished by the Nash Engineering Co.; one hand windlass and a Fairbanks Morse steering engine The propellers were supplied by the Columbian Bronze Corp. The electric refrigerator and ice machine were supplied by the Westinghouse Electric & Mfg. Co. In addition to the independent auxiliary generator, one 5 k.w. General Electric generator is attached to the forward end of each main engine.

An oil-burning boiler, fitted with Ray oil burners, supplies hot water heat to all accomodations. There is a filtering plant for the culinary water supply taken from the river. The galley equipment is complete and modern including an oil burning range. Control for the electric steering gear is mounted in the pilot house.

Sergeant Pryor, twin screw, diesel drive, survey boat, built for United States engineers for use on Missouri river

Useful Hints on Cargo Handling



THE relation of ship and stevedore is a special relation, according to a decision in a recent admiralty case. The ship is a place of employment and the ship's tackle is used in the work of loading and unloading. It is, therefore, the duty of the ship to use due care in providing a reasonably safe place to do the stevedoring work and reasonably safe appliances for the doing of it.

In the case referred to, it was found that the owner of the ship was negligent and liable to a longshoreman, injured by gas, in permitting the stevedore to load the ship before dissipation of the fumes of deadly hydrocyanide gas with which the ship had been fumigated. It was further found that the longshoreman was not contributorily negligent since this gas gives no evidences of its presence other than its effects; and further that $750 was adequate damages, it appearing that the injured workman was discharged from the hospital after four days.

Where space is available, it is a wise precaution to keep a certain amount of excess dunnage on the pier, made up in drafts. If the occasion arises when additional dunnage is required in a hurry, these drafts can be lifted and brought to the shipside without delay. Having such dunnage available will eliminate loss of time in procuring more should an additional supply be required quickly.

Claim for Cargo Damage

ACCORDING to a case in admiralty law where a cargo owner's agent, before removal of goods from a pier, gave to the vessel's agent written notice unequivocally stating the cargo owner's intention to hold the vessel responsible for all damages, such writing was sufficient, not only as notice, but as a "claim" within the meaning of the bill of lading. This is especially true where the shipowner, within the period fixed for filing claims, was, by joint report submitted by the surveyors for the shipowner and cargo interests, apprised of the exact loss.

Mere knowledge of an ocean carrier that goods have been damaged in transit is no excuse for failure to file notice of claim when required by the bill of lading, but substantial compliance with the claim clause in an ocean bill of lading is sufficient, and notice of claim and a claim for cargo damage, required by a bill of lading, may be contained in one letter.

THIS page is being devoted to short items on all matters having to do with the more efficient turnaround of ships. These items are intended to be of a helpful nature.

We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.

Better Platform Slings

THERE is much room for improvement in the designing of platform slings. The author visited recently terminals in New York which were using slings which damaged the cargo. A better design of slings used successfully by many stevedores protects the cargo adequately and reduces stevedoring costs because less delay results in attaching the hook for hoisting.

Most damage on the terminals visited resulted from poor equipment and careless handling of cargo, rather than poor cases and other packages. When packages are poor, a wide awake organization brings it to the attention of the shipper and works with him to improve the packing.

On a terminal visited recently all tractors and caster wheel type trailers were equipped with rubber tires.

At a coastwise terminal a tractor will haul two trailers loaded with 1000 to 1500 pounds of freight up a steep gangplank. The gangplank is sanded to prevent slipping.

If the floor can carry the load, all pier capacity may be increased by piling cargo. Cargo-piling by machine is cheaper in cost, also this method makes it possible to stack cargo, without the necessity of building "steps" from which men must work in piling freight. Machines can therefore concentrate a greater amount of cargo in any given space.

Keep Gear in Good Order

IN CONJUNCTION with simple diagrams showing correct rigging with proper sizes of wire rope, shackles, links, blocks and pad eyes for three-ton and five-ton booms, the safety department of Lykes Bros. Ripley Steamship Co. has issued the following instructions:

A thorough examination of all cargo gear should be made at least twice each voyage. Booms should not be used below 30 dogrees from horizontal for heavy loads. No slings with broken strands should be used. The same applies to any worn shackles, pins and rings where the diameters have been reduced below a safe working load. All wire rigging should be kept sufficiently well oiled so that the lubrication will penetrate to the inner strands.

The pie plate sling (6 feet circular platform placed in a net sling) is more effective for handling barbed wire than net sling. Catching of barbs on the net which causes delay is avoided.

Should Use Proper Gear

IN A RECENT paper presented before the greater New York Safety conference, Frank E. Ames, manager of safety department, Lykes Bros., Ripley Steamship Co., calls attention among other things to the loss of time due to the failure of gear as well as injuries. Many accidents and costly delays are caused by not using the proper gear for the different commodities handled. Careful attention should be given to the proper rigging of vessel's derricks and other cargo gear. Safe gear and safety conscious longshoremen will handle a maximum tonnage in a given period of time.

Longshore labor is made up of men just as intelligent as those employed in other heavy industries. In order to train longshoremen in the principles of safety, it is suggested that the squad leader train the men of his squad, the supervisors train the squad leaders and the manager train the supervisors.

Up and Down the Great Lakes

Traffic at the Soo — Vessels in Service — Grain Shipments —Coal and Ore Shipments—Lake Levels—Proper Channel

TOTAL freight passing through the Sault Ste. Marie canals, United States and Canadian, during the month of August was 7,731,060 tons as against 6,989,719 tons in 1934, an increase of 10.6 per cent. Shipments of wheat more than doubled, increasing from 17,314,202 bushels last year to 38,722,817 bushels. Other grains, however, declined from 4,439,417 bushels to 1,287,846 bushels. Iron ore increased from 4,316,053 tons to 4,801,324 tons, and westbound stone also increased from 33,537 tons to 101,459 tons.

Traffic through the Welland ship canal also showed an increase, 1,333,875 tons moving during August of this year as compared with 1,272,951 tons moved during August a year ago. Wheat shipments increased by 176,010 tons or 5,867,000 bushels; petroleum and other oils, by 12,371 tons; wood pulp, by 80,899 tons; and soft coal, by 24,972 tons. Decreases, however, were shown in pulpwood, down by 77,613 tons; iron ore, by 58,053 tons; barley, by 23,845 tons; and oats by 13,021 tons.

There was also an increase in the total movement of freight through the St. Lawrence canals. During August this year 1,023,684 tons moved as against 866,256 tons during August, 1934. Increases were shown in wheat shipments, which moved in the amount of 263,349 tons, 162,970 tons being moved last year, an increase of 100,379 tons. Westbound corn increased by 29,547 tons; pulpwood, by 17,964 tons and hard coal, by 17,516 tons.

More Vessels Employed

The number of bulk vessels in operation on the Great Lakes as the season advances is steadily increasing, as shown by figures compiled by the M. A. Hanna Co., Cleveland. As of Sept. 15, out of a total fleet of 324 American bulk vessels of 2,720,300 tons trip capacity, 178 vessels of 1,682,100 tons trip capacity were in commission, or 54.94 per cent in number and 61.84 per cent in carrying capacity. Of the number of vessels in commission, 160 were engaged in the ore trade.

This is a slight increase over the number of vessels in commission as of Aug. 15 last, when 174 vessels of 1,600,200 tons trip capacity were in service, 153 in the ore trade, representing 53.71 per cent of the number and 58.82 per cent of the total carrying capacity of the 324 vessels of the available fleet.

The current figures of vessels in commission compare favorably with those in commission as of Sept. 15, 1934. At that time only 153 vessels of 1,376,400 tons trip capacity were in service, 115 vessels engaged in the ore trade. This represented 46.65 per cent of the number and 50.07 per cent of the total carrying capacity of the vessels then available.

August Lake Levels

The United States Lake survey reports the following monthly mean stages of the Great Lakes for the month of August, 1935, determined from daily readings of staff gages.

Lakes	Feet Above Mean Sea Level
Superior	603.14
Michigan-Huron	578.62
St. Clair	573.91
Erie	570.87
Ontario	244.06

Lake Superior was 0.16 foot higher than in July and it was 0.38 foot above the August stage of a year ago, 0.66 foot above the average stage of August of the last ten years.

Lakes Michigan-Huron were 0.01 foot higher than in July and they were 0.64 foot above the August stage of a year ago, 0.81 foot below the average stage of August of the last ten years, 3.56 feet below the high stage of August, 1929.

Lake Erie was 0.01 foot higher than in July and it was 0.57 foot above the August stage of a year ago, 0.99 foot below the average stage of August of the last ten years, 2.91 feet below the high stage of August, 1929.

Lake Ontario was 0.26 foot lower than in July and it was 0.56 foot above the August stage of a year ago, 1.60 feet below the average stage of August of the last ten years.

Toledo Propeller Club

At a recent meeting of the Propeller club, port of Toledo, the following officers were elected to serve during the period of 1935-1936:

President, Wallace Tomey, bureau of navigation and steamboat inspection, Toledo; vice president, Ralph J. Scheidinger, Consolidated Paper Co., Monroe, Mich.; secretary-treasurer, Leroy N. Watson, Harbor Terminals Inc., Foot of Madison avenue, Toledo; and chairman, board of governors, Leo J. Petrot, New York Central Railroad Co., Union Station, Toledo.

Ore Shipments Increase

Ore shipments from upper lake ports during the month of August showed an increase of 618,804 tons or 14.87 per cent over the movement during August a year ago. The ore moved during August of this year amounted to 4,780,570 tons, as compared to 4,161,686 tons a year ago. There is also an increase in the total movement for the season up to Sept. 1, 1935, 17,386,599 tons being shipped this year as against 15,685,211 tons moved during the same period in 1934.

Shipments of ore by rail from Lake Erie ports to furnaces during the month of August amounted to 2,392,363 tons, making the total for the season up to Sept. 1, of 9,062,977 tons, as compared with total shipment of 8,280,458 tons for the same period in 1934. On Sept. 1, 1935 the balance of ore on dock at Lake Erie ports was 4,554,923 tons as compared with 4,855,814 tons on Sept. 1, 1934.

Must Use Proper Channel

Col. M. C. Tyler, corps of engineers, United States army, and division engineer for the Great Lakes, with offices in Cleveland, has issued the following notice:

"Complaints have been made to this office that some downbound freight vessels are violating the rule for lower Detroit river established by the secretary of war, which provides that downbound freight vessels shall enter Lake Erie via the channel west of Detroit river light.

"The district engineer, Detroit, Mich., has been directed to take such steps as may be necessary to secure compliance with the rule."

The Great Northern elevator, in Superior, Wis., is constructing a marine unloading leg with a capacity of 15,000 bushels per hour which is to be completed Oct. 1.

Canadian Grain Shipments Exceed Last Year

From Aug. 15, to Sept. 14 inclusive, grain was shipped from Fort William and Port Arthur, Ont., via lake vessels, as follows: Wheat to Canadian lower lake ports, 10,931,483 bushels; to Montreal, 2,769,968 bushels; to Sorel, 259,885 bushels; to Buffalo, 7,604,326 bushels; and to United States ports other than Buffalo, 2,787,655 bushels. This makes a total of 24,353,317 bushels of wheat shipped via lake vessels from Fort William and Port Arthur from Aug. 15 to Sept. 14.

Shipments of oats moved during the same period from the same ports in the following quantities: to Canadian lower lake ports, 196,911 bushels; to Montreal, 72,268 bushels; and to Buffalo, 81,848 bushels; making a total of 351,027 bushels of oats shipped from these ports.

The movement of barley from the same ports totaled 455,536 bushels, 125,747 bushels to Canadian lower lake ports and 329,789 bushels to Montreal. Only 29,051 bushels of flaxseed were moved during this period, all to Montreal. The rye shipments amounted to 99,785 bushels, 56,000 bushels to Canadian lower lake ports and 43,785 bushels to Montreal. The only barley malt moved was 2,881,840 pounds to Montreal.

During the same period, screenings moved in the following quantities: 2421 tons to Canadian lower lake ports; 1728 tons to Buffalo; and 3572 tons to United States ports, other than Buffalo.

The grand total in all kinds of grain shipped via lake vessels from Fort William and Port Arthur, from Aug. 15 to Sept. 14, both inclusive, was 25,288,716 bushels, and 7721 tons of screenings.

For Season Up to July 31

From the opening of navigation this year to July 31, grain shipped, via lake vessels, from Fort William and Port Arthur, Ont., totaled 50,296,603 bushels. This amount includes a total of 43,961,613 bushels of wheat of which 38,133,183 bushels were shipped in Canadian vessels and 5,828,430 bushels in American vessels; 2,401,807 bushels of oats, all shipped in Canadian vessels; a total of 3,331,183 bushels of barley, 2,945,647 bushels in Canadian vessels and 385,536 bushels in American vessels; a total of 107,000 bushels of flaxseed, all shipped in Canadian vessels; and a total of 495,000 bushels of rye, 445,000 bushels in Canadian vessels and 50,000 bushels in American vessels.

Of the above total of 43,961,613 bushels of wheat shipped in both Canadian and American vessels, 31,332,027 bushels went to Canadian ports and 12,629,586 bushels to American ports; while of the total of 2,401,807 bushels of oats shipped, 2,271,807 bushels went to Canadian ports and only 130,000 bushels to United States ports. Of the total shipment of barley, 3,331,183 bushels, 2,041,376 bushels went to Canadian ports and 1,289,807 bushels to United States ports. The total shipment of flaxseed, 107,000 bushels, went to Canadian ports, while 185,000 bushels of rye were shipped to Canadian ports and 310,000 bushels to United States ports.

The above movement was handled in 314 cargoes, 292 being in Canadian vessels and 22 in American vessels.

American Grain Shipped

American grain shipments by water from Great Lakes ports have been substantially smaller so far this year than during the corresponding 1934 period. The movement from Duluth, from the opening of navigation to Sept. 1, amounted to only 9,040,633 bushels compared with 26,604,112 bushels in the corresponding period last year. Decreases were shown in shipments of all types of grains, the drop in movement of oats being particularly sharp, from 6,674,990 bushels to 264,500 bushels this year. Corn shipments declined from 4,867,461 bushels to 680,598 bushels. Grain shipments from Milwaukee also have declined this year, though the decrease has been less marked than at Duluth. For the season to Sept. 1, shipments totaled 1,496,011 bushels against 2,567,745 bushels a year ago.

The lake movement of grain from Chicago during 1935 will be the poorest in many years, it is indicated by activity to date. Shipments this season to Sept. 14 totaled only 3,675,000 bushels, against 28,069,000 bushels last year and an average of 46,205,300 bushels for the entire season during the past ten years.

Light traffic in all grains is a reflection of last year's drought and curtailed planting. Corn deliveries have been particularly light, shipments from Chicago declining from 18,864,000 bushels last year to 296,000 bushels. Wheat shipments were off from 8,021,000 bushels to 2,908,000 bushels.

Reduced supplies of grain have resulted in increased imports to Chicago from foreign countries. Such receipts have included corn from Georgian bay that was shipped from Chicago in the fall of 1934 and brought back within the last few months, corn from Argentina and South Africa and rye from Poland by way of Montreal. Grain receipts for the season to date via the recently opened Illinois waterway total 983,000 bushels, against shipments of 78,000 bushels.

Coal Movement on Lakes Shows Good Increase

Shipments of bituminous coal via lake vessels from Lake Erie ports, from the beginning of the season up to 7 a. m. Sept. 16, amounted to 24,164,199 net tons of cargo and 763,471 net tons of bunkers, giving a total of 24,927,670 net tons. This is a decrease of 390,075 net tons from the total tonnage moved last year, which amounted to 25,317,745 net tons, 24,521,194 net tons of cargo 796.551 net tons of bunkers.

The total movement of bituminous coal for the season this year, however, was an increase of 2,880,999 net tons over the tonnage moved during the same period in 1933, and 10,151,941 net tons over the same period in 1932.

Cargo coal moved during the same period in 1933 amounted to 21,399,481 net tons and bunkers, 647,190 net tons, totaling 22,046,671 net tons. In the comparable period of 1932, cargo, bunkers and total bituminous coal shipments were respectively, 14,419,704 net tons, 356,025 net tons, and 14,775,729 net tons.

Average shipments of bituminous coal each week for the four weeks ending 7 a. m. Sept. 16 amounted to 1,131,781 net tons of cargo, and 37,317 net tons of bunkers, or a total of 1,169,098 net tons. This is about a 20 per cent increase from the average weekly shipments for the four preceding weeks.

For the season up to Sept. 1, anthracite coal shipments on the lakes amounted to 387,774 long tons, which is a decrease from the movement last year. For the same period in 1934, anthracite coal moved amounted to 443,685 long tons. In 1933, only 236,188 long tons moved, and in 1932, 154,622 long tons.

The above figures are compiled by the Ore and Coal Exchange, Cleveland.

Charles A. Williams Dies

For many years associated with lake traffic affairs, Charles A. Williams, 58, lake traffic manager for the Jones & Laughlin Steel Co., died of heart disease at his home 13518 Detroit avenue, Lakewood, O. on Sept. 18.

Born in Cleveland, Mr. Williams was graduated from West High school of that city, and in 1895 at the age of 18, began his career with the old firm of J. H. Outhwaite & Co., agents for Jones & Laughlin Co. When W. G. Pollock succeeded the Outhwaite company, he continued on and was advanced to the position of traffic manager, when the steel company took over the Pollock business in 1921.

Queen Mary Sea Trials Set for Next May

Sea trials of the Cunard White Star superliner QUEEN MARY are to be held May 21, preparatory to entering the Southampton-New York express service next June.

Work on the new liner has been progressing rapidly, and somewhat ahead of schedule. From the outside, the vessel looks almost completed. The two masts are in position, as are two of the three funnels. Most of the deck planking has also been laid. In addition to special bulkheads, built into the body of the ship, extra steel columns have been erected in each engine room.

Careful attention is being paid to the details of construction, as it is felt that they will have no small part to do with the final success of the ship in providing the utmost in comfort to passengers.

Foreign Trade Convention

The Twenty-second National Foreign Trade convention of the National Foreign Trade council will be held in Houston, Tex., Nov. 18, 19 and 20. According to James A. Farrell, chairman of the National Foreign Trade council, a record attendance is expected.

A committee representing the Houston chamber of commerce, 84 steamship lines, 17 railroads and agencies, the Foreign Trade council of Houston, and banking, industrial, agricultural, insurance, educational and other bodies interested in the future of America's foreign commerce, is taking care of arrangements.

Heavy Exports of Scrap

Heavy exports of scrap metal through the port of Boston has become an important factor in its foreign commerce. Up to the first of September this year, exports of iron and steel scrap from Boston to Italy alone, totaled 42,829 tons, while last year not a single pound was shipped to that country from this port.

The first seven months of 1935 the total scrap metal shipped amounts to 93,854 tons, 27,381 tons of which went to the United Kingdom, 12,291 tons to Roumania, and 14,773 tons to Japan. This is far ahead of the exports of this material for the entire year of 1934 when 14,299 tons were shipped to foreign countries.

Two All-welded Diesel Boats Completed at Manitowoc

THE BEAVER STATE, one of two new all-welded work boats built by the Manitowoc Shipbuilding Corp., Manitowoc, Wis., was recently delivered to her owner, the Great Lakes Dredge & Dock Co., Chicago. The other vessel, also delivered, was built for the L. A. Wells Construction Co.

The principal characteristics of the BEAVER STATE, shown in the accompanying illustration are: Length overall, 45 feet; beam, 11 feet, 10 inches; molded depth to lowest point of sheer, 6 feet, 3 inches; extreme draft, 4 feet, 9 inches; and minimum freeboard, 2 feet, 6 inches. An unusually trim-looking craft, the hull, welded into one integral piece of steel, is stronger than a riveted vessel of the same type; and the construction is lighter.

Propelling machinery consists of one, 6-cylinder, 60-horsepower Kahlenberg semi-diesel engine.

The assembly of the deck house and pilot house into a single integral unit is an interesting feature. It permits easy removal of the entire unit to provide ready accessibility for engine installation or removal.

All welding on the two tugs was done with shielded arc equipment supplied by The Lincoln Electric Co., Cleveland, O.

Beaver State, all-welded diesel workboat recently completed by the Manitowoc Shipbuilding Corp. for the Great Lakes Dredge & Dock Co.

Capt. Henry R. Lewis Dies, Baltimore Mail Line

Capt. Henry R. Lewis, who had been marine superintendent of the Baltimore Mail line since inauguration of its service from Baltimore and Norfolk to Europe in 1931, died at his home in Baltimore, on Aug. 18.

Captain Lewis was born in Wales of American parents in 1877. At the early age of 13 he went to sea, and at 24 became master of the sailing ship LADSTOCK. He also sailed on wooden clipper ships between Australia and London, and was in the THERMOPYLAE which made one of the fastest voyages on record for sailing ships between Australia and London.

He then joined the International Mercantile Marine Co., and for twenty years served on vessels of this line. He sailed as officer aboard vessels during the World war. When he was first officer on the S. S. NEW YORK, with Admiral Simms and staff aboard, the liner was torpedoed, but was brought safely into port, although all of the passengers had been transferred to another vessel.

He was commander of the MAGNOLIA, the first ship to establish passenger service to Germany, following the World war. He also commanded the liners S. S. NEW YORK and S. S. ST. PAUL of the old American line.

Some years ago, Captain Lewis took an executive position with the International Mercantile Marine Co. ashore, acting as personnel superintendent, and marine superintendent for the Atlantic Transport and Leyland lines. He had charge of the reconstruction of the Baltimore Mail line fleet of five vessels, and served with this line in the capacity of marine superintendent until his death.

He is survived by his widow, two daughters and a son.

Marine Superintendent

Joseph Cook, port engineer for the Baltimore Mail Line for the past four years has been appointed marine superintendent, succeeding the late Capt. Henry R. Lewis. He will continue to discharge the duties of port engineer while Capt. Lyle Blanchard has been appointed port captain. These appointments were announced by G. F. Ravenel, managing director of the Baltimore Mail line and vice president of the Roosevelt Steamship Co.

A booklet, entitled *Some Notes on Bethlehem Alloy Steels*, was recently published by the Bethlehem Steel Co., Bethlehem, Pa. It contains a physical property chart for each of the seven types or groups of alloy steel that are quite fully described.

Personal Sketches of Marine Men

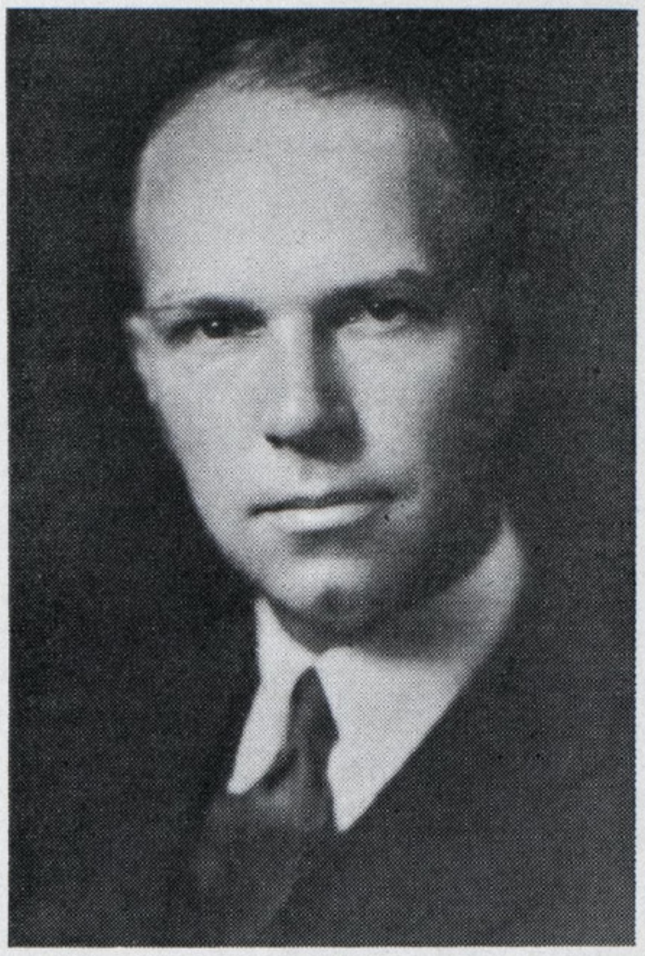
Robert C. Lee, Vice President, Moore & McCormack Co. Inc.

By Ben K. Price

A GRADUATE of the Naval Academy, he served with distinction in the navy for a period of 10 years, before, during, and after the war.

HE BECAME associated with the merchant marine 15 years ago and is recognized, both here and abroad, as an authority on shipping.

BELIEVING that future movement of freight will be in fast vessels, running on regular schedule, he advocates preparing for this trend.



ROUNDING out 30 years of marine activity, Robert C. Lee, vice president of the American-Scantic line and of its parent company, Moore & McCormack Co. Inc., New York, is prominent in ocean shipping—well-known here and abroad. An Annapolis graduate, in active service in the World war, (in the famous Brest patrol) and later captain of the United States naval port at Nantes, he entered commercial shipping 15 years ago.

Mr. Lee, interestingly, was born in the heart of the Middlewest—in Central City, Neb. The event responsible for his career, which was to take him to the far corners of the earth and to link his fortunes with the sea, was his appointment to the Naval academy in 1906.

At the time of his appointment to the Naval Academy he was 17 years old. Prior to that he had lived not only in Nebraska, but also in Colorado, Idaho and Utah, and it was from Utah that he received his appointment to Annapolis.

Graduating from Annapolis in 1910, he spent 10 years at sea, serving in various capacities from watch officer to commander. In the World war, he was commander of the destroyer WAINWRIGHT, operating off Brest, and prior to that he was fire control officer on the battleship ARIZONA.

His service as captain of the United States naval port at Nantes, France, came at the close of the war—for about a year. He was in charge of all merchant, as well as naval shipping including the direction of materials and the loading of troops for their return home. He came back to this country, in 1919, as inspector of navigation materials for the navy. During the year or so spent in this capacity he was located at the plant of the Sperry Gyroscope Co., Brooklyn, N. Y.

At present, Mr. Lee's time is divided about equally between this country and the other side, where he founded subsidiary organizations and now spends much of his time in Denmark, Sweden, Poland, Finland, Russia and the central European countries. He founded the Polish subsidiary of the American-Scantic line in Warsaw and Gdynia, in 1929, and the Czechoslovakian subsidiary in Praha in 1933. An excellent organizer, he also established offices at Stockholm, in addition to those already located in Sweden, at Gothenburg. Familiar with several foreign languages, he speaks French and German fluently.

Affiliated with the above mentioned subsidiaries and also engaging Mr. Lee's attention, among others, are a/s Moore & McCormack, Copenhagen; Cia Moore & McCormack, Buenos Aires, and Moore-Mack Gulf line. Under his direction, as executive in charge of operations, are 19 company-owned boats and 15, either under charter or in operation by his company as agent.

Mr. Lee is a strong advocate of the handling of freight in fast ships. The slow tramp steamer is becoming increasingly less important in world trade, with the time approaching, he believes, when most freight will be handled by swift liners, running on regular schedule. This time, he declares, should be hastened, insofar as American shipping is concerned, by the likely enactment of ship subsidy legislation at the next session of congress.

Mr. Lee is also an advocate of conferences and cooperation between shipping lines of all nations, and has recommended both here and abroad a rationalization of sailings, which he believes is essential in bringing back prosperous times in shipping.

At present, Mr. Lee declares, there is a mad race in shipping between all countries, which if continued will not only bring grief to shipping companies, but will throw a heavy burden on taxpayers. Just as the furious competition between world powers in the matter of naval construction was checked and molded into an orderly program by the Washington conference a few years ago, so can much be accomplished, Mr. Lee believes, in mercantile shipping by closer understanding among leading shipping lines of all countries.

Mr. Lee is a member of the American Society of Naval Architects and Marine Engineers, the Maritime exchange and the Steamship Owners' association, all of New York; associate member of the American clubs of Copenhagen and Stockholm; and a member of the Naval Reserve association.

Bunker Oil

(*Continued from Page* 16)

water. Since distillation and fractionation are parts of the refinery process, the limitation must be high enough to permit such water as may enter by condensation in storage tanks and moderate leakage in barges and tankers.

4. The limitations on chemical impurities must be practically absent. These impurities may be of three types any of which would require a relatively expensive process for removal. The three types are due to:

(a) Elemental constituents in the crude oil.

(b) Elemental constituents in materials added during the refinery process for the protection of equipment or for improving the quality of the more valuable products.

(c) Undesirable chemical compounds which may be formed during the refining process.

Considered from the viewpoint of the ship operator: Operators of ships are of four classes:

(a) Commercial operators whose aim is profits.

(b) Private operation whose aim is comfort or pleasure.

(c) Naval operators whose aim is national security, and

(d) Other government operators whose aim is some kind of special service but who, in general, are classed with commercial operators and hence can be considered as having identical aims. They will be discussed as commercial operators.

The requirements of the various operators are principally under three heads—price, quality, and availability of supply.

For commercial operators price is the primary consideration. The cheaper the fuel, the lower his operating costs will be unless the cheap fuel causes him considerable additional expense in repair, cleaning, or other maintenance costs. Very wide quality specifications will usually hold added maintenance costs down sufficiently to make the cheapest fuel in dollars per barrel or in cents per B.t.u. the most desirable fuel. A line operator need consider availability of fuel only at terminal points and in most cases at only one such point, if his vessels are designed with sufficient cruising radius. A tramp operator is much more concerned with the general distribution of fueling facilities, but a generous bunker capacity will provide for most contingencies in this respect. However, since the fuel oil he wants is the cheapest and is the one described above under the petroleum industry's viewpoint this is the one which he will find in every bunkering station throughout the world.

To the commercial operator, the refiner's specifications must govern. This condition works to the disadvantage of other classes of operators, because probably more than 90 per cent of all marine bunker fuel oil is used by commercial operators. The refiner's interests are, therefore, to cater to the commercial operator and to force his own specifications on private and naval operators who do not control the source of their fuel oil.

Private operators are very few in number. The trend in the type of vessel operated is toward diesel engine propulsion. The amount of bunker fuel oil used is very small. In general the requirements resemble those of the naval operator.

The naval operator, for stategic military reasons, is much more concerned with quality than with price, but the determining factor is distribution and availability of supply. Properly he should use a type of fuel oil which can be obtained in large or small quantities at any time in any part of the world. Facilities to provide for this supply of the higher grade of fuel oil could be provided specifically for the navy only at considerable expense. It has never been done, hence the navy must depend on commercial fueling facilities in most part. This unfortunate circumstance presents a conflict with the consideration of quality of fuel oil. The apparent specifications which the navy should use are those imposed by the requirement of the petroleum industry.

That this cannot be done as easily as by commercial operators is due to three causes. First, the commercial operator who has only a few ships can, where necessary, alter his equipment, using funds which he can definitely save in the future by the use of the cheapest fuel oil, whereas the navy can do this only when authorization for the necessary funds is made by congress. Second, the much more complicated fuel oil systems, of naval vessels and the greater operating flexibility required of naval vessels make the use of a very viscous fuel oil much more difficult than for merchant vessels even though the weight and space could be spared to make the necessary mechanical provisions. Third, any casualty caused by water or physical or chemical impurities in the oil might be much more costly in military operations than any probable casualty could be in commercial operations.

Considered from the viewpoint of the designer: The marine designer's viewpoint must be that of the ship operator for whom he is working. If it is accepted that the operator's best interests are served if he is able to use the cheapest and most readily available fuel oil, then the designer must accept the refiner's viewpoint as much as he is able. The only balance between the two is price. If the designer requires the refiner to spend money for treatment of his fuel oil to meet specifications, the added cost must not raise the price of oil sufficiently to drive the designer to coal. Assuming that the cost of installing and operating a pulverized coal plant is the same as that of a fuel oil plant, the price per horsepower of fuel oil must be less than that of coal or the oil industry jeopardizes the market for its by-product. Yet sacrifice of this market might be preferable to installing costly equipment and processes to render the fuel oil saleable.

The designer then must provide for using the product which will be turned out as a liquid by-product by refiners for the life of the equipment he is designing except for such requirements as he can force the refiner to meet by subjecting the by-product to inexpensive and simple treatment.

Shortcomings of present specifications: Of the four general requirements of fuel oil specifications only one is properly handled by present specifications and that only for one class of fuel oil. This is the water limitation of bunker C. or grade 6. The reason for the shortcomings is apparently the lethargy of consumers of fuel oil. A specification which was prepared as a wartime makeshift proved acceptable to the petroleum industry because of the freedom permitted. It proved generally acceptable to the average commercial consumer and for a while to the navy. It proved acceptable to the former because he was in a position to shop for his fuel and to demand satisfaction. That satisfaction demand was in effect a specification even though not published and not reduced to specific requirements backed by definite tests. The navy was satisfied until serious difficulties, against which the specification did not provide, arose. A study of all the factors indicated that other possible difficulties might easily appear at very inopportune times.

Criticisms of present specifications: The criticisms of the present specifications are as follows:

(A) *Viscosity.* The only reason which occurs to the writers for classifying fuel oil according to viscosity is that different plants are physically equipped to handle fuel oils of certain limiting viscosities. In this case viscosity is entirely a function of temperature. Any fuel oil can be raised to high fluidity, if it can be sufficiently heated.

The temperature to which the oil in a marine vessel can be heated depends on the amount of heating equipment, the ambient temperature of the oil and the safety factor. The oil in a flat horizontal tank or a thin vertical one on the skin of a ship will very nearly attain the temperature of the sea water outside. The oil in a deep tank, which has only the bottom surface contiguous to the sea, will have an average temperature much more nearly

(*Continued on Page* 40)

Bunker Oil

(*Continued from Page* 38)

approaching that of the air in adjoining spaces. The former describes more than 90 per cent of all naval bunker tanks and the latter probably applies to from 75 to 90 per cent of all merchant vessel bunker tanks.

It can be fairly safely assumed that the lowest temperature to which oil in double bottom tanks may fall is the freezing temperature of sea water plus a small differential, say about 35 degrees Fahr. It can be just as safely assumed that except for the bottom layer, which possibly cannot be reached by pump suctions anyway, the lowest temperature to be expected of oil in deep tanks is between 60 degrees and 70 degrees Fahr. Either type of tank may be equipped with heating coils of ample size and it will be assumed that the maximum permitted temperature is 120 degrees Fahr. minus 10 degrees Fahr. allowed for fouling and design calculations, or 110 degrees Fahr. can be attained.

If the vessel with heated tanks is favored with short lines or extremely well insulated lines, it can be assumed that oil from the heated tanks may reach the pump suction at a temperature very close to 110 degrees Fahr. If the lines are long and exposed, a temperature drop of at least 20 degrees Fahr. can be expected between the tank and the pump suction.

There are thus at least four classifying minimum temperatures at which fuel oil may reach the pump suction for different designs of storage systems. These are approximately 35, 70, 90, and 110 degrees Fahr. This temperature is absolutely imposed by local conditions and season of operation and by design and cannot, for any vessel be changed without equipment alterations.

As far as the freedom of flow and pumping is concerned, the temperature is of no moment. The characteristic of importance is fluidity or its converse, viscosity. Uncompleted work at the naval boiler laboratory clearly indicates that the desirable pumping viscosity is between 300 and 400 SSF. This is in confirmation of the laboratory's recommendation to the shipping board ten years ago that this viscosity should be about 375 SSF.

We now have the basis for a viscosity classification for fuel oil to compare with the existing one. Four classes are indicated as follows:

1. Maximum viscosity 375 SSF at 35 degrees Fahr.
2. Maximum viscosity 375 SSF at 70 degrees Fahr.
3. Maximum viscosity 375 SSF at 90 degrees Fahr.
4. Maximum viscosity 375 SSF at 110 degrees Fahr.

Compare these with the federal classifications:

a. Maximum viscosity 100 SSF at 77 degrees Fahr. (25 degrees C.)

b. Maximum viscosity 100 SSF at 122 degrees Fahr. (50 degrees C.)

c. Maximum viscosity 300 SSF at 122 degrees Fahr. (50 degrees C.)

which were based, many years ago, on the use of round numbers.

In the opinion of the writers the shortcoming of the existing method is that standard temperatures are used for measuring the limiting viscosity because of the assumption that the temperature-viscosity curves of all fuel oils follow definite laws. It appears to be much more reasonable to specify the limiting temperatures at which a standard viscosity will not be exceeded as our table above does.

(B) *Physical Impurities.* Both federal specifications and commercial standards have a provision that fuel oil must be strained if required. This requirement is 20 years old, yet many refiners are not yet equipped to strain oil upon delivery from a refinery and investigation indicates that practically no barges or tankers are so fitted. Apparently, very few purchasers have required straining, presumably preferring to accept strainable impurities and to take care of them by strainers provided in their own systems. Thus the freedom of the oil from physical impurities which will not pass a 16-mesh screen is not definitely required by the specification. This should be corrected.

As regards smaller physical impurities which may clog or erode equipment, an effort has always been made to exclude them. Changing characteristics of the fuel oil have altered the results obtained by the old tests, yet the tests themselves have not been altered.

If, in addition to straining, the extraction test were specified for all classes of bunker fuel oil, it is considered that the needs of the situation as regards physical impurities would be met.

(C) *Water.* The present specification requirements for bunker C (grade 6) that water be determined by distillation is considered satisfactory and should be extended to all classes of bunker fuel oil. The limits now given are not too high, although it would be advantageous to specify the amount of reduction in price to be imposed for water in excess of 1 per cent.

The present test does not differentiate between water and other heavier than oil impurities. It does not measure the water emulsified in the oil, and in case the density of the oil approached that of water not all of the free water will be measured. This test should be definitely discarded.

(D) *Chemical Impurities.* It is regarding chemical impurities that present specifications are woefully lacking in restriction. It is due to these that many serious and many other annoying difficulties have arisen. Because of changed characteristics of fuel oil, due to cracking, which have been just recently seriously felt and the probability that cracking will be considerably extended in the future, it is expected that difficulties of this kind will arise increasingly in the future. Study and research in this problem have been much retarded and we are not in a position yet to make any specific recommendations. So far as we have been able to find out everyone else is in the same position.

Bringing the various viewpoints into line: There are only two general recommendations possible for bringing the refiner, the ship operator, and the marine engineer together on the question of fuel oil specifications.

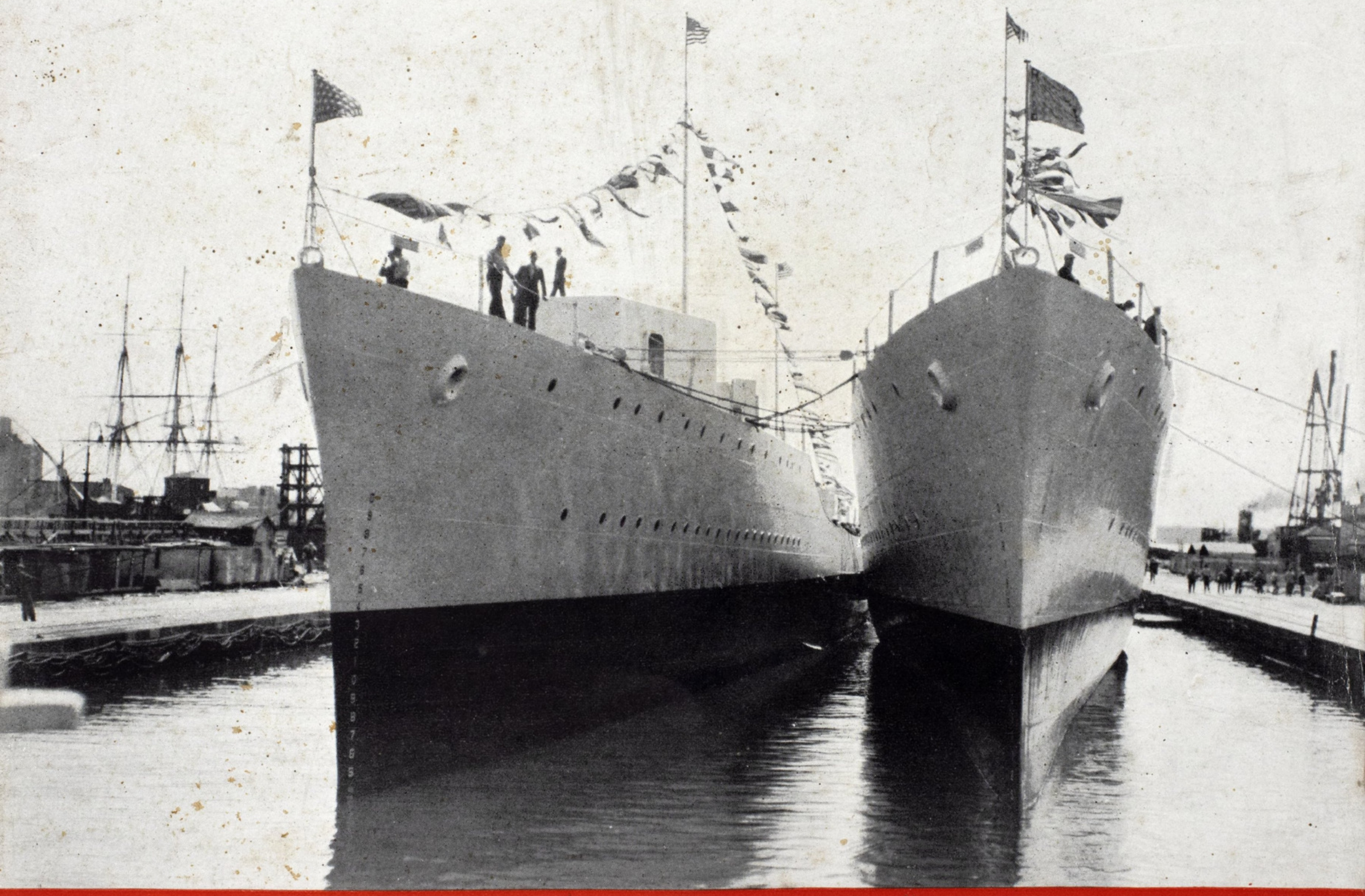
(1) It is necessary for the marine user of fuel oil to insist that his needs be considered as separate and apart from those of the stationary operator and that this fact be recognized in federal specifications and commercial standards. The slight differential in cost which might be imposed by such insistence will be compensated for by the increased flexibility of operation and the reduction in maintenance cost. This differential should never exceed the natural economic differential existing by virtue of the fact that competition with coal enters at a lower fuel price for shore than for marine use. Unfortunately the consumer today is unable to specify his fuel oil definitely because the necessary information is lacking.

(2) It will be necessary for the marine user of bunker fuel oil to educate the oil industry thoroughly in its problems. To accept the oil man's statement that you should be able to burn anything because he does so in his own plant, or that you should be able to handle a very viscous fuel oil because some particular shore plant or his own tankers do, is to accept an unwarranted handicap. There are too many different ships in operation in different climates, and under different operating conditions, to generalize too closely.

Marine Review

Reg. U. S. Pat. Off.

The National Publication Covering the Business of Transportation by Water



Destroyers Conyngham, Case Launched

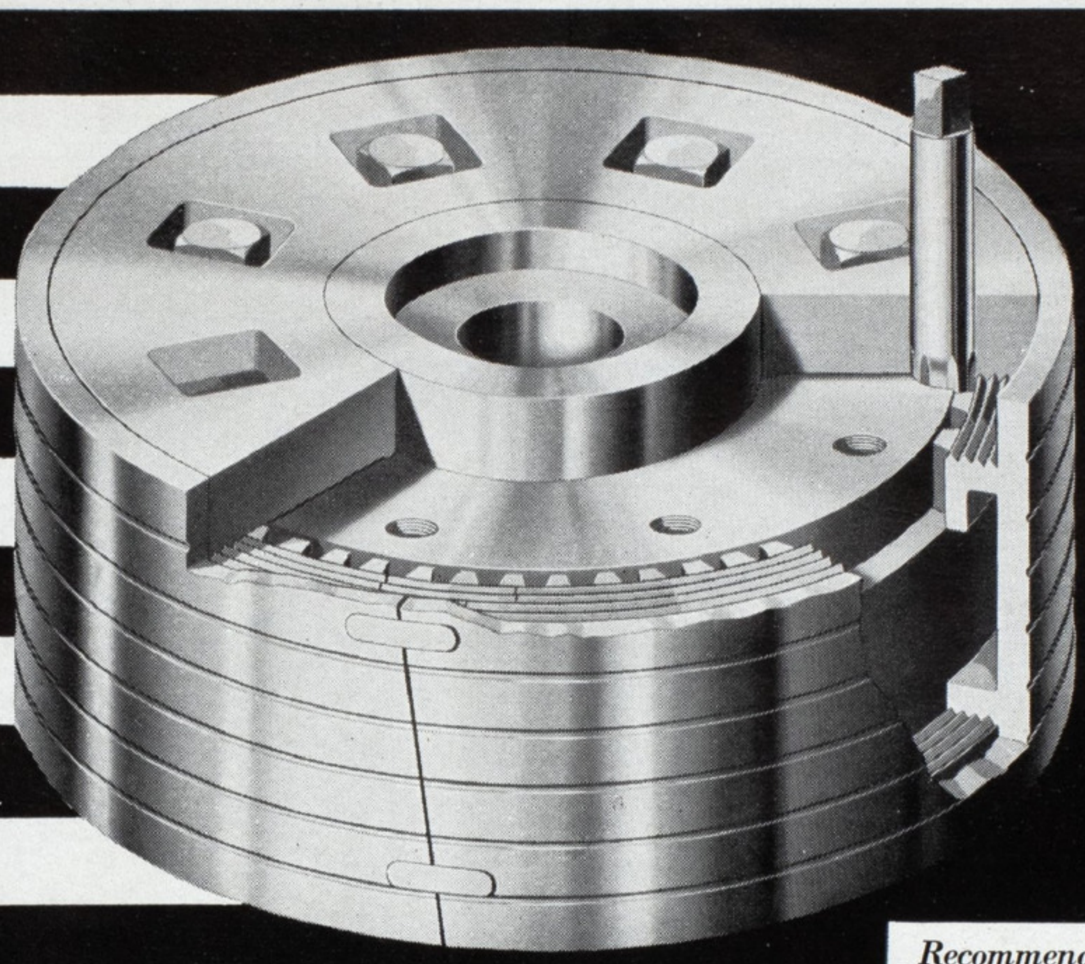
October, 1935

They like it!

The Bodenlos ADJUSTABLE Plug Piston

just needs an opportunity . . . to prove its superiority to YOU

1. Readily adjusted to take up wear
2. Can be adjusted in the cylinder
3. A true circle at all diameters
4. Cannot steam set
5. Saves steam by assuring snug fit



Recommended also for piston valves

JOB NO. 1 sold five more to the same owners ❖ 16 ships equipped in 10 months.

TEN months ago we announced the Bodenlos ADJUSTABLE Plug Piston. Sixteen ships on the Great Lakes are now using it.

The reports of these users more than fulfill expectations.

The new Bodenlos Adjustable Plug Piston saves steam. Engineers tell us that the fit is so snug that less steam and less fuel is necessary to secure the same number of engine revolutions.

This new piston fits so smoothly that it seems to float in the cylinder. One engineer could not believe that tightness was possible with such freedom, so he made a rough test by pouring a bucket of kerosene on top of the piston. Although kerosene seeps through faster than water or steam, two days passed before it leaked below the piston.

The Bodenlos Adjustable Plug Piston saves on the re-boring of cylinders as well as on general maintenance. This new piston cannot score cylinders because it acts as a solid plug. It can readily be adjusted to take up wear, so *the more it runs, the better it fits.* One engineer reports that he did not score the cylinders even when the boilers primed. The fit was so tight that no abrasive material could get between piston and cylinder wall.

The Bodenlos ADJUSTABLE Plug Piston is especially adapted for super heat and high steam pressure. It is a true circle at all diameters and adjustments. It is made of finest Hunt-Spiller iron and will wear indefinitely. Is it any wonder that everyone who is using one of these pistons wants more? Why not investigate?

Write our nearest sales agent for further information.

The AMERICAN SHIP BUILDING CO.

Main Office: Foot of West 54th Street, Cleveland

Sales Agents

Leco Engineering Company
205 South Peters St.
New Orleans, La.

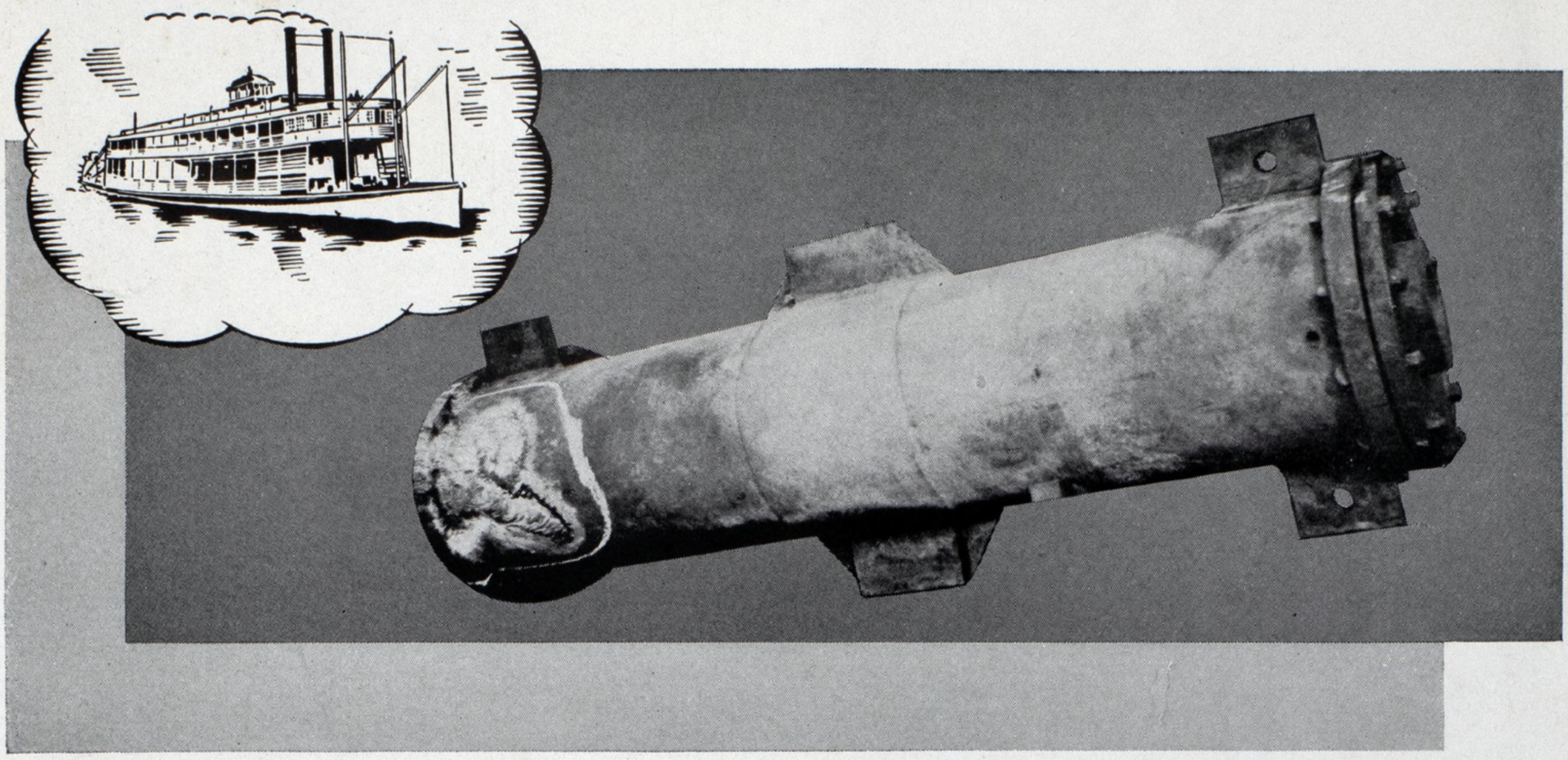
L. E. Caverly
117 East "B" St.
Wilmington, Calif.

United Dry Dock, Inc.
11 Broadway
New York, N. Y.

Vol. 65, No. 10, October, 1935, issue of MARINE REVIEW, published monthly at Cleveland, O. Entered as second class matter at the post office, Cleveland, O., under act of March 3, 1879. Subscription price $3 a year in U. S.; Canada, $4; Great Britain and other foreign countries, £1. Single copies, 35c

OXWELDING KEEPS

OLD-TIME STEAMER IN SERVICE



In service since the end of the Civil War, this cylinder cracked on a recent voyage. Oxy-acetylene welding gave new life to this old timer and quickly put the steamer back into service, saving $3,000.00 and ten days' time.

Saves $3,000.00 and ten-day delay

In ten hours, at a total cost of $80.00, a cracked steamboat cylinder was repaired by oxwelding. The company saved not only $3,000.00, the price of a new cylinder, but . . . what was even more important . . . the loss of ten days' operating time. This is a typical instance of the substantial economies which are being achieved in the marine industry with oxy-acetylene welding and cutting.

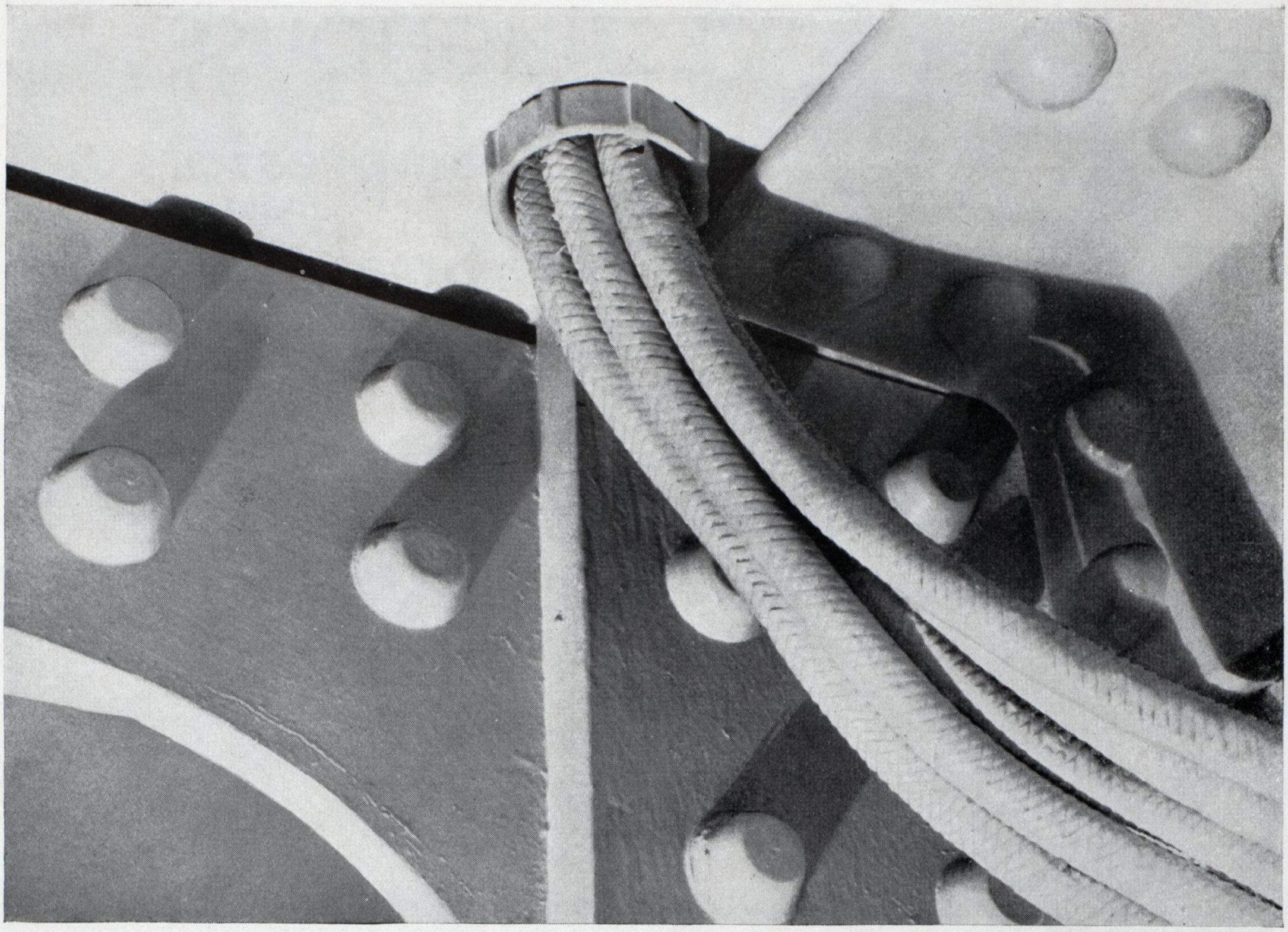
For construction, repair and maintenance, the oxy-acetylene process has proved a versatile tool which readily meets the varied requirements of shipyard work. In fabricating various shapes from steel plate, automatic oxy-acetylene machine cutting is saving time and lowering building costs. Oxy-acetylene welding assures strong, jointless assemblies that are leakproof.

In every phase of marine work . . . new construction or repair . . . Linde engineers will gladly cooperate with you to secure the maximum benefits and economies of oxy-acetylene welding and cutting. The benefit of their broad experience is available from Linde Sales Offices located in thirty principal cities throughout the country and at 30 East 42nd Street, New York, N. Y. The Linde Air Products Company, Unit of Union Carbide and Carbon Corporation.

Everything for Oxy-Acetylene Welding and Cutting

LINDE OXYGEN • PREST-O-LITE ACETYLENE • OXWELD APPARATUS AND SUPPLIES

FROM PRODUCTS OF UNITS OF UCC UNION CARBIDE AND CARBON CORPORATION LINDE UNION CARBIDE



Seaworthy Nerves for Your Ship

ELECTRIC cable — running under floorplates, through bulkheads, along deck houses, over boilers, everywhere — thousands of feet of it, miles of it—carrying power for pumps, lights, motors, compass. Is it seaworthy? Was it designed by men thoroughly familiar with the demands of the ocean? Was it engineered for marine service?

You can't judge cable by its appearance. All marine electric cable looks alike — outside, an armored sheath; inside, copper wire. What lies between makes or ruins the cable — the insulation is the vitally important part. For the quality of this insulation, you can, of course, make tests, but in the last analysis you must depend on the integrity of the manufacturer.

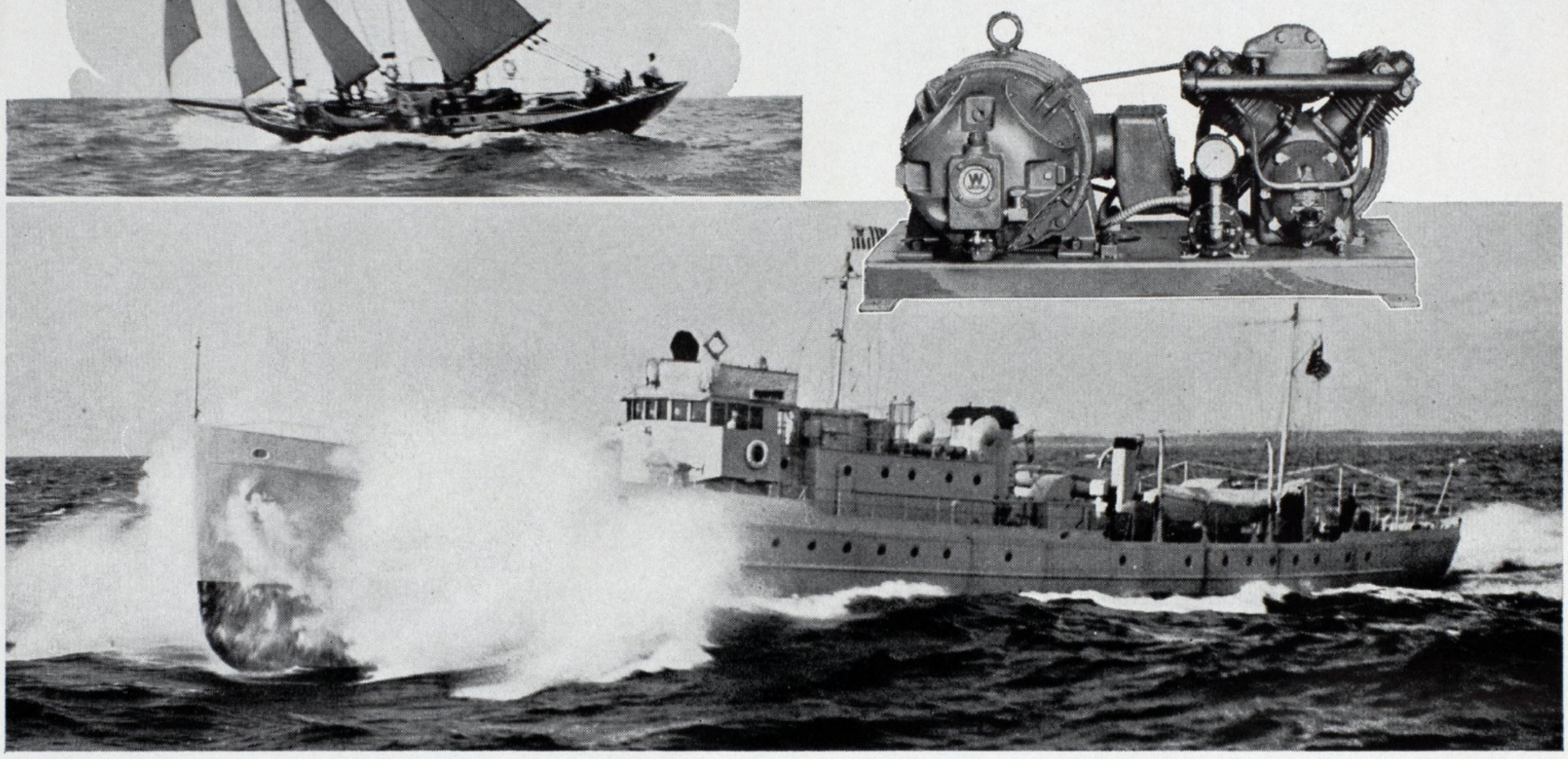
General Electric has furnished more marine cable and has had wider experience than any other company. G-E cable is built with an understanding of the service. It *has* to be good, it *must* stand up, for on it rests the reputation of a company that makes millions of dollars worth of marine equipment a year.

Don't gamble on cable — it can be too expensive, in delays, loss of light, loss of control, fire. Be sure of seaworthy nerves for your ship — insist on G-E cable. General Electric, Schenectady, N. Y.

520-30

GENERAL ELECTRIC

WESTINGHOUSE
Air Compressors for Small Craft



FOR general pneumatic needs—including operation of signal horns—on small craft such as, power yachts, patrol boats, etc., we make a complete line of moderate size air compressors ranging from 3.6 to 33 cu. ft. displacement designated as the "Y" Type . . . They are compact, efficient, reliable. The "controlled" lubricating system is interlocked with a positive unloader in such a way that the compressor ***cannot deliver air if the oil supply is dangerously low***—a valuable protection feature.

Westinghouse Air Brake Company

Industrial Division - - - - Pittsburgh, Pa.

(9139)

THE FOLLOWING MANUFACTURERS HAVE TESTED OR EXAMINED THE QUALITY OILS MANUFACTURED BY GULF FOR DIESEL ENGINE LUBRICATION AND HAVE PRONOUNCED THEM SATISFACTORY FOR THE LUBRICATION OF THEIR DIESEL ENGINES.

GULF

Allis-Chalmers Manufacturing Co.
ANDERSON ENGINE & FOUNDRY COMPANY
ATLAS IMPERIAL DIESEL ENGINE CO.
Benz Diesel
Bethlehem Steel Company (INCORPORATED)
BOLINDERS
BUSCH-SULZER BROS.-DIESEL ENGINE CO.
CATERPILLAR TRACTOR CO.
CHICAGO PNEUMATIC TOOL COMPANY
CLARK BROS. CO.
Colo-Diesel
CONTINENTAL GIN COMPANY
COOPER-BESSEMER CORPORATION
CUMMINS ENGINE COMPANY
DE LA VERGNE ENGINE COMPANY
ELECTRIC BOAT COMPANY
F. A. B. Manufacturing Co.
Fairbanks, Morse & Co.
Foos
FULTON IRON WORKS CO.
HERCULES MOTORS CORPORATION
HILL DIESEL ENGINE COMPANY
Ingersoll-Rand Company
Junkers Corp. of America
Kahlenberg
Kromhaut Diesel Engine Co.
McINTOSH & SEYMOUR CORPORATION

Mianus
Muncie Oil Engine Company
NATIONAL-SUPERIOR COMPANY
NORDBERG,
R. A. Lister & Co. Ltd.
STANDARD MOTOR CONSTRUCTION CO.
STERLING ENGINE COMPANY
STOVER MANUFACTURING & ENGINE CO.
SUN SHIPBUILDING & DRY DOCK CO.
Superior Gas Engine Co.
THE BUCKEYE MACHINE CO.
THE BUDA COMPANY
The Hooven, Owens, Rentschler Co.
THE MICRO CORPORATION
THE OTTO ENGINE WORKS
The Power Manufacturing Co.
The St. Mary's Oil Engine Co.
THE UNION DIESEL ENGINE COMPANY
Tips Engine Works
VENN-SEVERIN MACHINE CO
Washington Iron Works
Weber Engine Company
WESTINGHOUSE
WINTON ENGINE CORPORATION
Wolverine Motor Works, Inc
WORTHINGTON PUMP AND MACHINERY CORPORATION

GULF DIESEL ENGINE LUBRICATING OILS

GULF

GULF REFINING COMPANY

District Sales Offices

Boston New York Philadelphia Atlanta New Orleans Houston Pittsburgh Louisville Toledo

Exide-Ironclad Battery, type TLM, for powering electric industrial trucks and tractors.

FOR 25 YEARS, EXIDE-IRONCLAD BATTERIES HAVE CUT MATERIALS HANDLING COSTS

The Exide-Ironclad Battery, developed in 1910, offers many advantages to users of electric industrial trucks, the most outstanding of which is materials handling economy.

Exide IRONCLAD SILVER ANNIVERSARY 1910 – 1935

Both directly and indirectly, you can save with Exide-Ironclads. Directly, because your battery investment pays substantial returns over a long period of time—while maintenance costs are lowered from the start.

Indirect savings arise from the greater amount of work an Exide-Ironclad equipped truck can accomplish in a day. Not only does the high power ability of these batteries assure good speeds with heavy loads and grades, but their sustained voltage keeps materials moving at a productive rate clear to the end of the day.

These are the most important improvements that the Exide-Ironclad Battery, with its unique positive-plate construction, brought to materials handling service 25 years ago. They hold good today in increased degree because of the many refinements since made in the construction of the battery.

Let Exide-Ironclads improve your materials handling service at a saving. Write for free booklet, "The Adaptability of Electric Industrial Trucks and Tractors."

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Exide
IRONCLAD
BATTERIES
WITH EXIDE MIPOR SEPARATORS

"MIPOR," Reg. U. S. Pat. Off.

BOOKS

A selected list for the man interested in Marine Subjects

ABELL—Stability and Seaworthiness of Ships $5.00
Gives consideration to those practical problems affecting a ship's stability and seaworthiness which the shipmaster may be called upon to deal with or consider in the ordinary routine of his calling.

ADAMS—Modern Diesel Engine Practice $6.00
A complete text book on every phase of diesel engineering, construction, and installation.

BEASLEY—Freighters of Fortune $3.50
A quick moving tale of adventure of fighting and of the first attempts at crude commerce on the Great Lakes all of which helped to lay the foundations for what is today one of the richest and most powerful sections of the world.

CARR—Cost of Shipbuilding $3.00
This book provides a short method in calculating the cost of the many different types of merchant vessels and to eliminate the practically obsolete system of figuring this class of work.

CHALKLEY—Diesel Engines for Land and Marine Work $8.00
A discussion of the theory, operation and construction of the diesel engine as used in marine and land work.

CUTHBERTSON—Freshwater $7.50
This book is designed to be of interest to all who want to know all they can about the ships and those who want a general story of Great Lakes history with a glimpse at men, ships and events. Illustrated with a series of excellent pictures showing early types of lake craft, etc.

DOBBS—Canals and Inland Waterways $2.25
This book is of especial value to students interested in the subject of canals and waterways and to those who for one reason or another desire enlightenment on the subject.

FORD—Practical Marine Diesel Engineering $7.00
Deals with the construction and operation of the marine diesel engine from the viewpoint of the practical engineer.

HARDY—Bulk Cargoes $6.00
A clear and important discussion on how bulk cargoes are carried and in what ways the nature of the bulk cargo has affected the design and construction of vessels.

MACELWEE—Ports and Terminal Facilities $5.00
A thorough and detailed discussion of marine terminal facilities. Traffic conditions are analyzed and studied in their relation to port facilities for best service.

MANNING—Manual of Naval Architecture $2.75
Prepared primarily for operating officers, students and all those who wish to become familiar with the subject of naval architecture without any extensive previous knowledge of it.

MORRELL—Oil Tankers $4.00
A complete and authoritative treatise on oil carrying vessels, the handling of bulk oil and the transportation of bulk oil by water. Covers the subjects of modern design, construction, repairs and operation with respect to hull, cargo system and machinery.

PERRY—Ship Management and Operation $4.15
This book is the first to cover the subject and is based upon original research. Latest methods of organization and operation are described and illustrated. Organization charts showing the lines of advancement in various departments and fold-in drawings of main decks of modern ships are included.

ROSBLOOM—Diesel Reference Guide $4.00
A book for reference purposes and instruction on modern diesel engineering, land, marine, locomotive, aero-service, automotive and portable duties. Includes a directory of manufacturers of diesel engines and products essential in diesel service and is profusely illustrated, containing tables, formulae, etc.

WATTS—Hints to up-to-date Navigators $1.75
This little book would appear to be very useful to the junior officer who is taking his profession seriously and desires to adopt every means to advance his knowledge.

THE PENTON PUBLISHING COMPANY

1213 W. 3rd St. *Book Department* **Cleveland, Ohio**
224-M

Statement of the ownership, management, circulation, etc., required by the act of congress of Aug. 24, 1912, of MARINE REVIEW published monthly at Cleveland, Ohio, for Oct.1,1935, State of Ohio, county of Cuyahoga, ss. Before me, a notary public in and for the state and county aforesaid, personally appeared F. V. Cole, who, having been duly sworn according to law deposes and says that he is the Business Manager of MARINE REVIEW and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the afresaid publication for the date shown in the above caption, required by the Act of Aug. 24, 1912, embodied in section 411, Postal laws and regulations, to wit: 1.—That the names and addresses of the publisher, editor, managing editor and business managers are: Publisher. The Penton Publishing Co., Cleveland, O. Editor, A. H. Jansson, Cleveland, O.; Business Manager, F. V. Cole, Cleveland, O. 2.—That the owners are: Names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock: The Penton Publishing Co., Cleveland, O., John A. Penton, Cleveland, O.; C. J. Stark, Cleveland, O.; J. D. Pease, Cleveland, O.; F. V. Cole, Cleveland, O.; J. R. Dawley, Cleveland, O. 3.—That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None. 4.—That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. F. V. Cole. Sworn to and subscribed before me this 19th day of Sept., 1935. (Seal) H. L. Richey. (My commission expires May 7, 1936).

INDEX TO ADVERTISERS

—o—

50%

OF THE SHIPS HAVING MARSEILLES AS THEIR HOME PORT ARE

Gargoyle Lubricated

MARSEILLES IS FRANCE'S gateway to Mediterranean ports. And of the ships operating out of this beautiful harbor, 50% depend on Gargoyle Marine Lubricants for the maintenance of their justly famous service.

So, in fact, do nearly half of *all* the vessels, domestic and foreign, that touch Marseilles!

Years of use throughout the maritime world have proved Gargoyle Marine Lubricants to be of the highest grade . . . of uniform quality.

These are some of the important reasons that account for such preference for Gargoyle Marine Lubricants as you find, for instance, in Marseilles. It is a preference that repeats itself in 350 of the world's leading ports! Socony-Vacuum Oil Company, Inc., Marine Sales Dept., 26 Broadway, N. Y. C.

GARGOYLE
MARINE
OILS

SOCONY-VACUUM OIL COMPANY, INC.